State of Utah

JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

Office of the Governor
PUBLIC LANDS POLICY COORDINATION

JOHN HARJA
Director

December 13, 2007

Selma Sierra
Director, Utah State Office
Bureau of Land Management
440 West 200 South, Suite 500
Salt Lake City, Utah 84101

SUBJECT: Supplement to the Price Field Office Draft Resource Management Plan and Environmental Impact Statement - Wilderness Characteristics

Dear Director Sierra:

The State of Utah appreciates the opportunity to work with the Bureau of Land Management as a formal cooperating agency in the preparation of Resource Management Plans and other environmental documentation throughout the state. The state also appreciates the BLM extending similar status to local governmental entities which have a stake in the planning area under consideration. The state firmly believes that cooperative discussions among the various landowners and regulatory agencies will lead to the best possible final product.

The state, local governments and BLM have invested considerable time and effort working together in these planning efforts. The state's expectation is that this process will lead to a well-reasoned and well-formulated plan. An important part of this process will be ensuring that the plan is consistent with state and local plans, policies, and laws, to the maximum extent possible. The plan will then, in turn, represent a reasonable compromise on the various facets of multiple-use management.

The Public Lands Policy Coordination Office (PLPCO) is tasked by state law to ensure that the positions of the state and its political subdivisions are considered in the development of public lands policy. To this end, PLPCO collected, reviewed and coordinated input from various state agencies, shared this information with local government, sought local government response, and prepared this response on behalf of the State. While the state considered local governments' input during preparation of its comments, the BLM should also give full consideration to the comments submitted directly by local governments. In particular, the BLM should carefully consider the

5110 State Office Building, PO Box 141107, Salt Lake City, Utah 84114-1107 • telephone 801-537-9801 • facsimile 801-537-9226 • 801-538-9727

ground-truth information submitted by Carbon and Emery Counties within the areas identified by BLM as possessing wilderness characteristics.

Initially, the state wishes to recognize and applaud the partnership it has with the BLM on many issues. The restoration and watershed improvement work funded and implemented through the Utah Partners for Conservation and Development is a good example of the achievements possible when agencies work for the improved health of the lands and resources. We are optimistic that similar efforts regarding cultural resources and air quality will be as successful.

The comments and concerns raised below are offered in the spirit of cooperation through disclosure, analysis and adherence to the provisions of law, regulation, good governance and common sense. The state recognizes planning as a dynamic process that will continue into the future, and reserves the right to supplement these comments as necessary. The state looks forward to resolution of these issues as a cooperating agency through the preparation of the Final EIS and Final Resource Management Plan.

The State of Utah commented on both the July 2004 Price Field Office Draft Resource Management Plan and Draft Environmental Impact Statement (DEIS) and on the June 2006 Supplemental Information and Analysis to the Price Field Office Draft Resource Management Plan/Environmental Impact Statement for Areas of Critical Environmental Concern (ACEC Supplement). Many of the state's prior comments address BLM's approach to assessing impacts associated with various resource uses. In most cases, BLM applied the same analytical approach in preparing the DEIS, ACEC Supplement, and the September 2007 Supplement to the Price Field Office Draft Resource Management Plan/Environmental Impact Statement for Non-WSA Lands with Wilderness Characteristics (2007 Supplement). To the extent our prior comments address methodological issues applicable to the 2007 Supplement, our prior comments are hereby incorporated by reference.

Economic Studies:

The state, through PLPCO, contracted with Utah State University and the University of Utah to complete a number of economic and social-attitude studies regarding the use of and value attributed to public land resources by Utah residents. These studies assess general attitudes of the citizens toward the public lands, off-highway vehicle use on public lands, grazing on public lands, potential Wild and Scenic River designation, and economic impacts of oil and gas exploration and production. Below are short summaries of a number of these studies which are works in progress. We will provide copies of these studies as they are completed and ask that you consider this information as you prepare the Final RMP and Final EIS.

A statewide survey of the residents of Utah, the *Utah Public Lands Study*, was conducted in the summer of 2007 by Utah State University. One focus of the survey questionnaire involved assessing various ways in which residents engage in economic activities that are linked to public land resources. Other major purposes involved

assessing attitudes toward public lands as part of the resident's' quality of life and sense of community, and assessing attitudes and preferences regarding public land management. A preliminary and partial tabulation of results for Carbon and Emery Counties is attached as "Attachment B." A more complete tabulation and analysis of results for these counties, as well as statewide results, will be submitted to BLM as they are completed.

Preliminary results from the *Utah Recreational Off-Highway Vehicle Use Study* conducted by Utah State University shows OHV use becoming increasingly popular, but the number of trips taken per year declining. Recreational activities that OHV users participate in are diverse, including both passive (sightseeing and photography) and active (camping and hiking). Rider motivation includes stress relief and nature appreciation, along with achievement, stimulation, independence and socialization with others. The study also shows economic impacts broken out by direct and total impact to both Carbon and Emery counties as well as by regional gross output, employment, household income, and value-added income. A "Random Utility Model" will be used to measure change in the allocation of trips across counties, measure change in the total number of trips taken by Utah OHV users, measure change in economic value accruing to OHV users and generate trip-distribution information for use in economic impact modeling. Full results will be made available upon completion of the study.

The Utah State University study, *Dependency on and Alternatives to Public Land Grazing by Operators in Utah,* will provide grazing data, including the survey of dependency on the public range, which will be made available upon completion.

The Bureau of Economic and Business Research at the University of Utah has completed an economic impact study of the oil and gas exploration and production industry in the Carbon and Emery County area of east-central Utah. (This Phase II study follows a similar Phase I study for the Uintah Basin.) The area is an increasingly important center of natural gas production from coalbed methane in Utah. Rapidly rising energy prices in recent years have stimulated greater production of both crude oil and natural gas in the northern Rocky Mountains, and the Carbon-Emery area is an integral part of the oil and gas industry in the Rocky Mountain area. The 2006 natural gas production in the area of 98.5 BCF was a 316 percent increase over the 1997 production of 23.7 BCF.

The rise in oil and gas activity is having a positive and noticeable economic impact on the Carbon-Emery County area. During 2006, the oil and gas exploration and production industry was directly responsible for an estimated 137 jobs and $6.5 million in wages in the two counties. When including indirect and induced impacts due to company and employee spending, the oil and gas industry accounted for 524 jobs and $22.2 million in wages in the area. This represents 4.0 percent of total employment and 4.9 percent of total wages in the area.

The industry also has a sizeable fiscal impact on local governments in the area. Property taxes paid on producing oil and gas wells were $10.2 million in 2006 and

accounted for 24.3 percent of all property taxes paid in the two counties. Federal mineral royalties distributed to the two counties by the Utah Department of Transportation during 2006 amounted to $13.7 million.

The full Phase II study is attached for your consideration as "Attachment C," and the Phase I study is also attached for your reference as "Attachment D."

Energy Permitting and Efficiency:

The Utah Legislature in 2006 adopted an energy policy requiring a streamlined permitting process to expedite issuance of permits for energy-related projects. Utah has a process to perform this function through its Department of Environmental Quality. The Price BLM Office should commit to utilizing this established process in the review of such applications.

Energy efficiency is a concept that was endorsed through the issuance of a Governor's Executive Order in April 2006 with a goal of achieving an increase of 20 percent by the year 2015. The state requests BLM commit to either work toward this goal, or start coordinating energy efficiency increases with the Governor's Energy Advisor.

Air Quality:

The state is concerned about possible impacts to air quality related values. State concerns are set against a backdrop of an upward trend in ozone (O_3) and particulate levels in much of the state. The upward trend in pollution levels combines with recent revisions to National Ambient Air Quality Standards (NAAQS) for small particulates ($PM_{2.5}$) and proposed revisions to the NAAQS for ozone. The convergence of these factors necessitates proactive efforts to avoid exceeding NAAQS or Prevention of Significant Deterioration (PSD) regulations.

In reviewing the RMP/DEIS, we note that the air quality analysis identifies the need to obtain federal or state permits before undertaking certain actions that have the potential to affect air quality related values. The RMP/DEIS also correctly recognizes the inability of a federal or state jurisdiction to knowingly grant a permit that would result in violation of NAAQS. While these statements are correct, it is important to note that most small and mobile emission sources are not required to obtain emission permits. While no such single source is likely to result in an exceedance of NAAQS or PSD increments, multiple small and mobile sources may have a cumulatively significant impact on air quality related values.

The state also recognizes that the extent of the air quality analysis required prior to permit issuance is generally proportionate to likely emissions from the proposed source. Accordingly, proposed sources capable of significant emissions are generally subject to more rigorous analysis than are proposed minor sources. Similarly, programmatic decisions such as this RMP/DEIS, while able to project anticipated

development levels, are generally unable to precisely locate future activity. The absence of such location data severely complicates any air quality modeling effort. It is therefore generally not appropriate to require minor sources or programmatic actions to conduct costly and difficult modeling of chemically reactive pollutants such as the precursors to ozone and $PM_{2.5}$. While this approach is generally reasonable, it raises a potential risk that multiple small and mobile sources that are individually unlikely to result in an exceedance of NAAQS or PSD increments may have a cumulatively significant impact on air quality related values.

Recognizing these difficulties and the need to accommodate implementation of planned actions, the state and the Division of Air Quality (DAQ) recommend a two-step approach to air quality analysis and management. The first step includes interim measures which should be taken to protect air quality related values. The second step includes a coordinated approach to assessing and protecting air quality in Utah.

As part of step one, we encourage the BLM Price Field Office to request operators apply best available control technology. We also encourage the BLM Price Field Office to adopt emission standards for compressor engines consistent with the *Four Corners Air Quality Task Force Report of Mitigation Options, DRAFT: Version 7*, June 22, 2007 (Task Force Report). The BLM Farmington Field Office, San Juan Service Center, and San Juan National Forest impose the Task Force's suggested standards as conditions of approval. These standards are 2 g/bhp-hr for engines less than 300 HP and 1 g/bhp-hr for engines over 300 HP. The state and DAQ encourage the BLM Price Field Office to impose these emission standards as lease conditions for all new and relocated engines, and as conditions of approval for all new APDs. BLM should also require producers to evaluate, and to the extent practicable, implement both EPA's Natural Gas Star BMPs and EPA's Recommended Technologies and Practices for all new or significantly modified natural gas facilities. Appropriate implementation of these technologies can produce considerable economic benefits while significantly reducing emissions.

These standards would positively impact air quality, facilitate continued action, and would be consistent with neighboring state jurisdictions. These standards do not replace the need for comprehensive analysis of regional air quality issues in Utah. Rather, they reflect interim steps that the state believes should be implemented if exploration and development are to proceed and while a more comprehensive regional approach to air quality issues is being developed. As the BLM Price Field Office makes future planning level decisions and site-specific decisions to implement the RMP, we suggest future air quality analysis include:

First, project proponents should assume, within the reasonably foreseeable development scenarios, that leasing and exploration will result in full-field development. Modeling should be conducted based on these reasonably foreseeable full-field development scenarios. Modeling of individual well emissions is insufficient because, as noted above, it fails to adequately capture cumulative effects.

Second, air quality analyses should be cumulative and include not only the planned field development but existing emission sources that may have coincident impacts. This means that an understanding of the emissions from other nearby existing or planned sources is needed to fully assess the cumulative impacts.

Third, air quality analyses should be based on anticipated worst-case meteorological conditions for each dispersion scenario, *e.g.,* the meteorological condition for high near-field impacts would be different than the meteorological conditions leading to high long-range transport.

Fourth, the air quality analysis should address compliance/attainment with all applicable air quality related requirements and standards. An evaluation of all criteria pollutants with specific emphasis on $PM_{2.5}$, ozone, and their precursors should be made.

Fifth, the air quality analysis should specifically address impacts to sensitive visual resources and other air quality related values that have been identified by the federal land managers.

Turning to step two, the state and DAQ encourage all agencies - federal, state, and local - to collaboratively identify and address air quality related concerns. The state and DAQ encourage these stakeholders to come together through an entity such as the Natural Resources Coordinating Council (NRCC), to develop more comprehensive analyses and region-wide modeling, and to assess the impacts of land use planning and plan-based decisions on air quality in Utah. As part of this regional effort, photochemical modeling is needed to evaluate the formation of ozone and secondary particulate matter, as both of these pollutants are currently trending upwards in rural parts of Utah. Models used for analysis of ozone and $PM_{2.5}$ should include the chemistry module needed to estimate the formation of secondary pollutants, *e.g.,* a photochemical grid model such as the EPA's Community Multi-scale Air Quality model (CMAQ) is recommended for the evaluation of ozone and secondary particulate formation.

Pending completion of comprehensive air quality analyses and region-wide air quality modeling, we encourage the BLM to work with stakeholders to research interim measures, such as those presented by the Four Corners Air Quality Task Force, to determine which emission mitigation strategies should be required as future lease and application for permit to drill (APD) conditions.

The state commends the BLM for its ongoing efforts to study and address air quality related matters and the strides that have been made since release of the 2004 DEIS. We anticipate addressing these matters in the Final EIS.

Wild and Scenic River Designation Studies:

The state acknowledges the requirement for the Price Field Office to conduct Wild and Scenic River studies as part of the Resource Management Plan revision process. Utah law, however, sets forth certain prerequisites for state support of a Wild and Scenic

designation, and directs that the BLM ensure appropriate information is developed, disclosed, and used as part of the WSR evaluation process. *See* Utah Code §63-38d-401(8)(a) thru (b). The law indicates, among other things, that river segments proposed for inclusion in the NWSRS should contain water at all times and possess an outstandingly remarkable value which is significant within a physiographic regional context, and that studies of the effects of designation on uses within the river corridor, as well as upstream and downstream from the corridor, are analyzed and disclosed.

In an effort to understand the nature and extent of the effects of wild and scenic river designations, Utah State University conducted a Wild and Scenic River designation study. The study was designed as: (1) a literature review and analysis of the recreation impacts of Wild and Scenic designation, and (2) a literature review and case study analyzing the impact of designation on non-recreational aspects of the economies of local communities and users. Preliminary results indicate (1) a lack of any "before and after" studies concerning the effects of designation of a wild and scenic river segment, (2) anecdotal indications of a designation effect as reported by researchers, but no statistical evidence, (3) the single study which statistically examined a designation effect found no evidence of an effect, and (4) various effects on uses of private lands and public land uses within and as a result of the designation. Complete findings will be available soon.

The state is also concerned about suitability findings for those streams where there are significant water diversions upstream of the subject reach, most of which are for irrigation. This is particularly true for the Price, San Rafael and Green River drainages. While federal reserved water rights are not asserted prior to designation, those stream reaches found suitable are managed as if they were designated. This "manage-as-if-designated" approach has the unfortunate and inaccurate potential to cause managers to believe a *de facto* federal reserved water right exists for those reaches, and thereby impact the future management and utilization of valid existing water rights above the reaches. The state believes that this suitability determination phase is the proper time to begin negotiations concerning the extent of any future federal reserved water rights. As a minimum, the State Engineer requests the BLM to catalog all valid, existing water rights which may be affected by designation as part of the *Affected Environment* or *Socio-Economic* chapter of each document.

Grazing, Wildlife and Watersheds:

The state supports, as a matter of policy, well-planned and managed livestock grazing, and considers the same as an important landscape-scale tool for creating and maintaining healthy watersheds and resources, including healthy habitat for wildlife. The state encourages the BLM to adopt the principle that functionality of the watershed underlies all the resource values of the planning area. The state and BLM are, of course, partners in a major effort to improve the health and functionality of watersheds through the multi-agency efforts of the Utah Partnership for Conservation and Development. To date, many thousands of acres of range and watershed lands have been reclaimed and restored through active efforts and properly managed grazing. Other often-cited examples of the use and value of prescriptive grazing and associated wildlife management are the privately-held Deseret Land and Livestock Ranch, and the Hardware

Ranch managed by the state's Division of Wildlife Resources. Flexibility of management practices has been the key to success of these two operations.

Utah State University has completed research into some of the issues related to the livestock industry in the Utah and the Price FO. (A portion of the report is attached as "Attachment E.") The report indicates that the trend in livestock grazing preference and authorized use in the Price Field Office is downward. It indicates that permitted AUMs have been reduced by at least 29% since 2003. The Draft EIS only lists 5,517 AUMs as suspended, and does not discuss reinstatement of these AUMs anywhere within the Price Field Office.

Because of the value of grazing, state policy discourages permanent closure of grazing allotments and encourages the reinstatement of suspended AUMs when range conditions permit. Permanent closure precludes using grazing as a management tool for improving watershed health, wildlife habitat, and the economic benefits of livestock production. The state, among other purposes, is supportive of the use of livestock in a prescriptive manner, that is, use of livestock in a "tactical" manner to accelerate progress toward improved rangeland health and the reduction of catastrophic fire. The state also believes that AUMs suspended for reasons of rangeland health should be reinstated to the permittee when rangeland conditions permit, and, if beneficial, subject to adjustment in the time and timing as discussed next.

The state strongly suggests that BLM support flexibility within the management provisions for livestock grazing time (duration) and timing (season of use) in the Final Plan. Through the Utah Partners for Conservation and Development, the Watershed Restoration Initiative, and the Utah Grazing Improvement Program, the state stands ready as a partner to work with the BLM to rehabilitate resources and improve grazing practices to benefit watersheds, wildlife and livestock. Retaining flexibility in the season of use will greatly aid in the control of undesirable plant species, and in the control of the fuels responsible for catastrophic fire.

In addition, the state encourages the BLM to cooperate with the state and conservation organizations to actively monitor and record grazing use data, wildlife populations and range conditions. The Final RMP should contain and rely on a robust monitoring program so that resource managers and users can communicate, learn, assign responsibilities, and use adaptive management to meet land health objectives.

Under Alternative E, 1,490,000 acres (60 percent of the PFO) would be categorized as either WSA or lands with wilderness characteristics. While closing this area to oil and gas development would reduce potential habitat loss, habitat fragmentation, and wildlife displacement, the ability to restore degraded wildlife habitat would be severely restricted. Because of altered fire regimes, invasive species, and other factors, the habitat conditions in the PFO are no longer "natural." Consequently, natural processes alone will not be enough to maintain or restore healthy watershed conditions. As noted on page 4-10, the lack of vegetation management would result in significant winter range loss for big game, and decreased crucial habitat for sage-grouse. Moreover,

vegetation treatments by natural processes only (p. 2-6) could also be detrimental to sage-grouse populations, would reduce big game habitat, and limit the ability to do habitat restoration work in a timely manner. The BLM is a key participant in the Utah Partners for Conservation and Development (UPCD) and the Utah Watershed Restoration Initiative. The inability to implement habitat restoration projects on BLM lands identified as WSA or wilderness characteristics lands would impede the UPCD's ability to restore and maintain healthy watersheds.

On a related note, the state believes the BLM should only employ the term "critical habitat" when referring to the legal habitat designations for endangered and threatened species under the Endangered Species Act. The state requests that the BLM use the "crucial habitat" designations mapped by the Division of Wildlife Resources solely as descriptive wildlife habitat designations, not as automatic exclusion zones for other multiple uses. The state also requests that these designations not be altered from alternative to alternative, as the area is defined based on DWR's wildlife inventories and may be refined or altered by the state as conditions require.

Inventory and Proposed Management of Areas with Wilderness Characteristics:

The State of Utah has reviewed BLM's inventory of and proposed management for lands identified as possessing wilderness characteristics. The state does not believe that BLM has authority to create a category of management based solely on the characteristics of wilderness. The characteristics of wilderness, or their constituent elements, were first recognized by the Wilderness Act of 1964 and passed to the BLM within the provisions of Section 603 of the Federal Land Policy and Management Act of 1976. The authority within Section 603 has now expired by its own terms. The state recognizes that recent court decisions affirmed BLM's authority to inventory for wilderness characteristics, and have required the BLM to consider new information about these characteristics in its documents prepared under the National Environmental Policy Act. These decisions do not, however, consider or affect the BLM's statutory authority for management policies, provisions or categories on the BLM lands. The state cautions BLM against an overly broad reading of these decisions. Management authority must be derived solely from the specific provisions of the Federal Land Policy and Management Act, (*e.g.* Areas of Critical Environmental Concern) or other specific federal legislation, and it is incumbent upon the BLM to carefully define its detailed legal rationale and reasoning for its proposed management policies, provisions and categories.

The State of Utah is committed to outdoor recreation, including primitive and non-motorized recreation, as an activity of great interest to the residents of Utah, and as an economic driver. The state supports retention of appropriate areas in their primitive, semi-primitive or rural state, after due consideration and in compliance with legal requirements. The state looks forward to working with the BLM to find appropriate management prescriptions and structures to protect primitive, semi-primitive and rural areas for the use of its citizens, and those of the nation.

Thus, the state asks BLM to provide a detailed explanation of the rationale and authority for management of lands solely because of wilderness characteristics, and why such management does not circumvent the provisions of the statutorily required wilderness review process. Further, the BLM must fully disclose the rationale and evidence which it believes supports a changed finding for those lands found not to have wilderness characteristics in the first survey in the late 1970s and early 1980s. Such rationale and evidence must contain a discussion of the detailed criteria used, nature and extent of the review, detailed field notes, and all other relevant evidence and legal reasoning. *See* 43 USC § 1701(l) and Utah Code § 63-38d-401(6)(b). As the Price Field Office moves forward, the state encourages BLM to take great care to read the court decisions carefully, and to comply with the Settlement Agreement resolving *Utah v. Norton*, No. 2:96CV0870 B (D. Utah Sept. 9, 2005). In particular, BLM should not exercise its authority under section 202 of FLPMA in a manner that establishes, manages or otherwise treats public lands as wilderness unless those lands were congressionally designated as wilderness or were previously designated as wilderness study areas pursuant to section 603 of FLPMA. In addition to these cautions, the state requests that, in weighing management options for the Final RMP, BLM give strong consideration to recommendations submitted by local government and not manage lands to protect wilderness character where such management would, in the opinion of local governments, be contrary to the interests of local residents. BLM should also consider the existence of inholdings and valid existing rights, including school trust lands, and not manage areas for protection of wilderness characteristics where development of inholdings or valid existing rights may compromise management of the area.

More detailed comments, and comments specific to individual areas identified as possessing wilderness character, are provided in "Attachment A" below.

Utah's Trust Lands and Land Tenure Adjustment:

Utah's School and Institutional Trust Lands Administration (SITLA) is an independent state agency responsible by law for management of lands granted to the State of Utah pursuant to the Utah Enabling Act, Act of July 17, 1894, 28 Stat. 109, for the financial support of Utah's public schools and other state institutions. The United States Supreme Court has referred to this Enabling Act land grant as a "solemn compact" between the United States and the State of Utah that obligates the United States to take into consideration the purposes of the grant when managing federal lands.

The State of Utah is obligated by both the Utah Enabling Act and the Utah Constitution to act as a trustee in managing school trust lands. Among the fiduciary duties imposed on SITLA by this trust is the duty to manage trust lands in the most prudent and profitable manner possible, and not for any purpose inconsistent with the best interest of the trust beneficiaries. Revenues from school trust lands are deposited in the Permanent School Fund, a permanent endowment for public education. Interest and dividends from the Permanent School Fund are distributed to individual public schools statewide annually to supplement critical academic needs.

SITLA manages an estimated 465,652 acres of school trust lands within the Price Planning Area (PPA), representing approximately 12 percent of all lands in the PPA. *See Draft Price Field Office Resource Management Plan* (2004) at Table 1-1. Most of these state trust lands are comprised of numbered sections 2, 16, 32 and 36 in each township, representing the grant of in-place school sections made by the Utah Enabling Act. State lands also include lands acquired from the federal government in a land exchange. The significance of the "checkerboard" pattern of land ownership is that, because most trust lands are surrounded by BLM lands, planning decisions made by BLM with respect to rights-of-way, withdrawals from mineral leasing, special designations (*e.g.* ACECs, management for "wilderness characteristics," etc.) and other determinations inherently impact the state trust lands making them an "island" within the surrounding BLM lands. BLM's decisions on how to manage its lands directly affect the ability of the State of Utah to manage state trust lands for the purposes for which they were granted by Congress, which was to provide revenue for public schools and other beneficiary institutions.

This is an issue of significant impact to Utah's school trust. Lands within the PPA make up approximately 13 percent of Utah's total surface trust land portfolio. At the current time, approximately 77,019 acres of surface and/or mineral trust lands are inheld in WSAs in the PPA. When these lands are added to the 131,963 acres included in proposed special designations, including non-WSA lands with wilderness characteristics in Alternative E, most of which is either closed to oil and gas and most other mineral exploration or NSO, Utah's school trust will be left with approximately 208,982 acres of lands within the PPA that cannot produce revenue or have reduced revenue potential.

Conversely, management by SITLA of school trust lands within special designations can directly affect the ability of BLM to manage the area for the purposes for which it was set aside. SITLA is not obligated by law, for example, to manage its lands within BLM areas set aside for "wilderness characteristics" or ACECs for environmental protection. SITLA's development of inholdings for cabin sites or other purposes consistent with its governing mandate may substantially defeat the purpose of the special designation. For this reason, it is in the best interests of the United States as well as the State of Utah that the Final RMP create a robust and effective program for land tenure adjustments.

The need for BLM to give priority to state-federal land exchanges has been recognized by BLM in the BLM Manual:

> The BLM recognizes that resolving these land ownership and management issues is an important public purpose *and gives priority to the exchange of state trust lands out of areas designated by the federal government for special purposes*.

BLM Manual H-2200-1, Chapter 13, B. (2005) (emphasis added).

As stated on page 2-23 of the Supplement, BLM is recommending that lands in special designations, such as ACECs, be retained in public ownership. This which would take approximately 1,490,000 acres in the Price FO off the table as exchange possibilities for the 208,000 acres of SITLA lands within special designations, or approximately 45 percent of SITLA's inholdings in the Price FO.

As more specifically set forth below, SITLA believes that the Supplement fails to address adequately these two major issues: The impact of BLM management decisions on state trust lands, and the need for a substantially more robust program for land tenure adjustments between the BLM and the State of Utah. BLM has an obligation to include in its planning an effective and timely means of addressing the impact of federal land actions on in-held state trust lands.

Cumulative Management Prescriptions:

The Draft Resource Management Plan and Draft Environmental Impact Statement for both the Kanab and Richfield Field Offices assess cumulative timing limitations and their impact on oil and gas exploration and development. For each alternative, the two Field Offices classified all BLM administered lands into one of seven categories: Standard lease terms, controlled surface use, cumulative timing limits less than three months in duration, cumulative timing limits between three and six months in duration, cumulative timing limits between six and nine months in duration, areas subject to NSO stipulations, and areas unavailable for leasing. For each alternative, the Field Offices quantified the percentage of lands within each of these six categories and prepared maps graphically depicting the locations of areas within each category. The Field Offices also compared lands within each of these six categories against oil and gas potential to assess each alternative's overall impact on oil and gas leasing and development. This type of analysis provides a highly valuable assessment of the cumulative impacts resulting from multiple concurrent management requirements. We strongly encourage BLM to complete a similar analysis as part of the Final Price RMP and EIS, and for all other RMPs within the State of Utah.

Real Property - Water:

BLM asserts it will honor all valid, existing rights. However, it appears that this statement may only apply to oil and gas, minerals, and grazing; no mention is made of water rights. Under Utah law, approved and perfected water rights are considered real property. BLM actions may affect the value of this real property. Because of this, the State Engineer recommends that the BLM consider the impact its actions may have on water rights in general and non-BLM water rights in particular. This recommendation is particularly important because the right to use water is the underpinning of most economic, environmental, and social activities. If it is determined that any valid, existing water right will be negatively affected by BLM actions, then possible mitigation and compensation actions should be discussed.

In conclusion, thank you for the opportunity to comment. The state looks forward to continuing to work with the Price Field Office as a Cooperating Agency. Further detailed comments and the various studies mentioned are attached. Please feel free to contact me with any questions or concerns about these comments, or the state's continuing desire to work with the BLM on the Final Resource Management Plan for the Price Field Office.

Sincerely,

John Harja
Director

cc: Price Field Office

Attachment A
Further State Concerns and Comments

Neighboring Field Office Actions:

The state notes that four neighboring BLM field offices are currently preparing RMPs and have Reasonably Foreseeable Development Scenarios (RFDS) for their plans. These RFDSs indicate how much development is anticipated to occur over the lifetime of the plans. Other federal agencies within the region may have RFDSs or similar projections for development on their lands. These should be identified and considered within the analysis. We also encourage the BLM to contact all state, federal, and tribal agencies within the region and collaboratively identify all significant reasonably foreseeable future actions that are likely to impact resources within the Price planning area. Such an analysis is especially important for air quality related values, wildlife habitat, and social and economic impacts.

Coordination Among Land Managers:

The state understands that, as part of the planning process, the Price Field Office met with other agencies with land management jurisdiction within or adjacent to the Price planning area. We encourage the Price Field Office to continue meeting with Park Service, Forest Service, state, local and tribal governments, and to use these meetings as an opportunity to harmonize management across jurisdictional boundaries, and to disclose, as part of the Final EIS, specific areas of management conflict and steps the Price Field Office will take to resolve conflicting management objectives.

Wildlife Habitat:

Habitat restoration work would be restricted under Alternative E due to the proposal to double the acreage of the current VRM class I area (p. 4-16). The VRM class I areas under Alternative E are vast and include crucial game, non-game, and sensitive species' habitats that require vegetation restoration activities. We recommend these areas not be precluded from vegetation manipulation.

Alternative E would also prohibit the placement of new guzzlers in crucial wildlife habitats (p. 4-22) that are part of a WSA or lands with wilderness characteristics. As wildlife populations expand, reintroductions occur, and climatic events result in drought conditions, constructing new guzzlers throughout these lands could become essential for wildlife survival. The Final RMP should not preclude the option of installing guzzlers where needed.

The state supports protection of important white-tailed prairie-dog habitat (p. 2-29). We recommend that BLM restrict use of utility poles to areas where underground conduits are impractical. We suggest BLM consider the use of raptor excluders on utility poles where needed. Alternative E leaves this area open to mineral entry. An open pit or

surface mining operation within areas occupied by white-tailed prairie dogs would be detrimental to the populations in that area. White-tailed prairie-dogs are often considered a keystone species, meaning that managing for them would also benefit other sensitive species including kit fox, burrowing owls, ferruginous hawks, and numerous other species.

On page 4-29, the word "maintained" is frequently used to describe the management plan for bighorn sheep habitat under Alternative E. It is unclear what is meant by the word "maintained." In many areas, allowing the proposed natural processes to treat vegetation (p. 2-6) would result in the loss of bighorn sheep habitat, and thus habitat would not be "maintained." The state recommends that the use of chainsaw crews, prescribed fires, and other types of vegetation manipulations be tools to help maintain bighorn sheep habitat.

The state is disappointed that the BLM is dropping the requirement for mitigation when significant acreages of important wildlife habitat are developed for energy resource extraction (p. 2-7). The phrase "encourage willing partners to participate in off-site mitigation strategies" is vague and does not convey the importance of wildlife resources and wildlife habitat within BLM public lands. At the very least, the decision to keep or drop the mitigation requirement should be evaluated in the alternatives.

On page 4-55, the alternative identifies the Gordon Creek Wildlife Management Area as a potential site for mineral material activities. While mitigation is mentioned, again, it is very vague and does not recommend specific measures. This area is not only sage-grouse habitat and a reintroduction site, it is also crucial mule deer and elk winter range. We recommend that mineral material activities affecting sage-grouse, mule deer, and elk habitat have seasonal restrictions and required mitigation for habitat loss.

Route Designation Comments:

The state agrees with statements found in the supplement that there would be a profound impact on motorized use within the planning area if Alternative E were selected as the preferred alternative. As stated, current trends do suggest the majority of recreational use will be motorized and developed recreation. Based on these trends, the recreation planning for this area should be framed to meet an appropriate portion of this motorized demand. The state is also supportive of protection of areas through non-motorized primitive and semi-primitive uses, but a better balance than that presented in this alternative is required.

There seems to be little or no provision in the designated routes shown on Map 2-69 for motorized routes primarily used by off-highway motorcycles. The proposed management for the areas with wilderness characteristics would eliminate most of the important areas for motorcycle use.

Alternative E would eliminate routes needed to complete loop opportunities that are crucial to successful management of OHV use. This would be counterproductive to the overall management of the planning area.

There are several highly valued existing motorized routes and crossings along and across segments of rivers proposed as suitable for scenic or wild designations. These routes and crossings should be preserved.

If all of the lands with wilderness characteristics, with the proposed management provisions, were included in the final decision, motorized use would be concentrated in the remaining lands. This could cause significant management challenges, and may negatively affect the recreational experience.

In the past, a wide variety of users have enjoyed motorized access. Routes developed for mining, oil and gas exploration, range development, *etc.*, have been explored and adopted by OHVs users to make popular trail systems. We believe these systems make up an important segment of the overall OHV opportunity in the state and, for the most part, should be preserved for future use to meet the acknowledged demand. The state looks forward to discussing specific route concerns with the BLM before the final decision is made.

Trust Lands:

Split Estate Issues

Alternative E does not directly examine split-estate lands where the subsurface mineral estate is managed by the BLM but the surface is owned by another party (*i.e.*, SITLA). BLM should re-consider whether it can impose its standards on split estate lands where it does not own the surface. This action would diminish the rights of the surface owner, whether fee or trust lands, to exploit its lands in the manner it sees fit. So long as the operator of an oil and gas well has obtained a satisfactory surface use agreement that can be included in its Application for Permit to Drill to the BLM, BLM should not unilaterally limit mineral development.

Paragraph 4.3.16 – Minerals and Energy Resources (page 4-45/58)

Alternative E does not contain a discussion of EPCA and the national energy policy. There is discussion, however, that implementation of Alternative E would likely cause 590 wells not to be drilled within the Price FO. The BLM should weigh the relative resource values, consistent with the multiple use and sustained yield mandates required by FLPMA. Alternative E does not adequately analyze the loss of revenue from formally or effectively eliminating mineral development in many of the lands subject to Special Designations and restrictive viewsheds. There is no indication what the loss of wells means in terms of lost revenue to the United States, the State of Utah, local governments, and Utah's school trust, and the effect of that revenue loss under EPCA. The full value of the revenue loss from not drilling and producing 590 wells could be in the billions of dollars during the life of the wells.

Based on SITLA's ownership of 12 percent of the lands within the Price FO, it can easily be assumed that 70 wells will not be drilled on SITLA lands if Alternative E is adopted. All bonus, rental and royalty revenues from these wells, at SITLA's standard royalty of 12.5 percent or 16.67 percent would be lost to the Utah Permanent School Fund, potentially a loss of over $500,000 a year to Utah schools. BLM should also note that, based upon recent discoveries in the area, average well production may be considerably higher than estimated, increasing the impact on Utah schools.

Considerable discussion has been made about oil and gas, but Alternative E also excludes 19,200 acres of potential coal lands from leasing. Removing coal lands surrounding any SITLA coal lands has the same effect of sterilizing its lands from production because the deposit becomes uneconomic to produce.

Lands and Realty page 2-19/21

A travel plan has not been submitted for the Supplement, nor has one been finalized at all for Carbon County in the Draft RMP. However, pursuant to the decision of the United States District Court for the District of Utah in *Utah v. Andrus*, BLM is obligated to grant reasonable access to the State of Utah and its grantees, assigns and/or successors-in-interest to school trust lands, notwithstanding any special designation or avoidance/exclusion area. In furtherance of this obligation, no existing roads providing access to trust lands should be closed without the consent of the State of Utah and SITLA.

Page 2-20's "Disposal of Lands Through Exchange" should specifically reference the need for federal acquisition of state school trust lands that are captured by federal reservations and withdrawals such as wilderness study areas, and that all land tenure adjustments necessary to accomplish this goal will be a priority, in accordance with applicable BLM policy guidance. *See* BLM Manual provisions concerning state exchanges. BLM should substantially increase the areas identified as available for disposition by exchange with the State of Utah, in order to eliminate of state inholdings in withdrawn areas.

To the extent that BLM creates new areas managed for preservation (*e.g.* ACECs or areas managed for "wilderness characteristics"), such designation has a direct economic impact on the Utah school trust. For all state trust lands inheld in such areas, it will therefore become necessary to identify and make available for disposal an equal amount of BLM land in order to permit BLM to acquire inheld state trust lands by exchange. BLM has failed to classify for disposal enough land to permit exchange of state trust lands out of existing WSAs, much less newly created areas. BLM should greatly increase the pool of available lands, and acknowledge that each special designation will require an accompanying land exchange.

State selection (*i.e.* quantity grants under the Utah Enabling Act, indemnity selections under the Utah Enabling Act, 43 U.S.C. §§ 870-871, and other applicable statutes) should be mentioned as an equally preferred method of land disposition as land

exchanges. The BLM's publicly-expressed policy concerning state selections, as described in the BLM Manual, is as follows: (1) the remaining entitlements of the States are to be considered as obligations and debts due the States by the federal government; (2) in applying applicable laws, regulations and policies, BLM is to consider the equities of the States to the greatest extent possible within the constraints of applicable law; and (3) satisfaction of state selections is deemed as "serving the national interest" in connection with FLPMA, including land use planning under FLPMA. BLM Manual 2621.06 A-C. *See also* BLM Instruction Memorandum No. 82-33, dated October 15, 1981 (IM 82-33).

Since the "Actions Common to All Alternatives" applies also to the Supplement, the following suggested language should be considered in the section for Lands and Realty:

> .... Lands identified for disposal must meet public objectives, such as community expansion and economic development. The preferred method of disposal is land exchange. Facilitating acquisition of state trust lands inholdings in wilderness study areas and other sensitive areas through land exchange is considered an important public objective, and will be given priority. State selections under the Utah Enabling Act and other applicable law will also be given priority pursuant to BLM Manual 2621.06A-C....

In addition to this modification, the criteria for land tenure adjustments should also be modified.

Under *Utah v Andrus*, the State of Utah is entitled to reasonable access across BLM lands to all school trust lands, including those within WSAs. If roads are proposed for closure in non-WSA lands when a travel plan is finalized for both counties, it could severely affect SITLA. The Supplement fails to address the impact of these closures on the economic value of the affected trust lands. At the very least, the BLM needs to consider: (1) continued motorized administrative access on "non-designated" routes providing access to trust lands will be permitted to SITLA, its permittees, grantees and successors-in-interest notwithstanding any closure to the general public; (2) SITLA, its permittees, grantees and successors-in-interest may undertake reasonable maintenance activities to preserve and improve existing access across BLM lands, after consultation and appropriate environmental review by BLM; and (3) existing routes that are the sole access to state trust lands will not be reclaimed without full BLM consultation with and approval by SITLA.

Impacts to minerals and energy resources (pages 4-31/32)

As noted in the Supplement, BLM's actions will have significant impact on non-BLM lands even though BLM does not specifically make land decisions on non-BLM lands. The largest source of revenue for the Utah school trust is from oil and gas bonuses and royalties. In much of Utah, in order to establish an economic oil and gas resource

play, the exploration company needs a large areal footprint. It is likely that multiple sections would have to be leased and developed in order to develop the necessary reserves to make the play economic. In SITLA's direct experience, companies will not lease one trust land section, if they cannot lease the surrounding BLM sections. BLM decisions to withdraw mineral lands from leasing in areas with "wilderness characteristics," ACECs, and other areas therefore directly affects the economic viability of SITLA's inholdings in those areas, particularly for oil and gas.

The BLM must reiterate that reasonable access to state lands, across BLM lands, would be provided under all alternatives, as an action common to all, with a notation that access to state trust lands will be granted even if an area is otherwise an avoidance exclusion area for ROWs. Under the decision of the U.S. District Court for the District of Utah in *Utah v. Andrus*, BLM is obligated to provide reasonable access to all state trust lands, including such lands located within wilderness study areas.

Economic Impacts of Withdrawing Mineral Lands from Leasing

BLM decisions to withdraw mineral lands from leasing in WSAs, areas with "wilderness characteristics," ACECs, and other areas directly affects the economic viability of state trust lands inholdings in those areas, particularly for oil & gas and coal. Restrictive designations additionally increase the cost of access to trust lands, may impair marketability, and require the expenditure of trust resources in pursuing land exchanges with BLM. These facts should be acknowledged appropriately in the discussion of socioeconomic impacts.

Geological Survey Data:

Many of the lands with identified wilderness characteristics, including, but not limited to the Muddy Creek-Crack Canyon and the Mussuntuchit Badlands, have known, significant vertebrate paleontological resources in which there are active paleontological field investigations. Access to many of these areas is already limited due to natural topography or limited vehicle routes. Further closure of the limited existing roads seriously hinders the ability to conduct field investigations and can result in a loss of the scientific and educational values of paleontological resources.

History - Cultural Resources:

This letter should not be considered Utah State Historical Preservation Officer (SHPO) comments under Section 106 of the National Historic Preservation Act. The state anticipates further consultation with the SHPO regarding more specific effects to cultural resources under the National Historic Preservation Act when the Final Plan is developed.

The state appreciates the BLM's efforts to conduct proactive resource identification, to work with rural communities towards understanding historic values, and to prioritize cultural resource inventory areas within the plan and under Section 110 of

the National Historic Preservation Act. The state suggests that BLM develop a specific ongoing program to identify and target identification efforts under Section 110 of the National Historic Preservation Act. Such a program could include taking input from the public on potential priority areas and balancing identification needs with public, tribal, development, resource interests, in consultation with the State Historic Preservation Officer. The state recommends that priorities include potential heritage tourism development in addition to more typical resource investigation and/or protection efforts. Under such a flexible strategy, identification efforts could better respond to public needs and interests. BLM should commit to developing a specific, measurable procedure for funding, identifying and conducting such resource identification efforts due to the overall benefits of these efforts for future plans and actions.

Inventory and Proposed Management of Lands with Wilderness Characteristics:

Identification of lands with wilderness characteristics

It appears that the Price Field Office undertook a two-step process to identify lands with wilderness characteristics. Step one was to review wilderness petitions presented by interested parties and determine whether they indicated the reasonable potential for the existence of wilderness characteristics. Step two was to determine whether wilderness characteristics did in fact exist. From supporting documents, it appears that in several instances the Price Field Office may have skipped step two and merely assumed the existence of wilderness character consistent with stakeholder proposals. Please clarify whether the Price Field Office determined the existence of wilderness characteristics for all proposals and provide updated files as necessary.

In the Wilderness Characteristics Review forms for the Vernal RMP/EIS Supplement, each determination of wilderness characteristics notes that the Vernal Field Office "determined appropriate set-back distances for pipelines, roads, and other R-O-Ws." The state supports buffering roads, pipelines, right of ways, and other features that have the potential to compromise wilderness character. Based on our review of individual Wilderness Character Review forms, it appears that the Price Field Office did not adopt a similar approach. Please clarify whether the Price Field Office incorporated set-backs next to a road, pipeline, or other right of way. If the Price Field Office chose to forego buffers, please explain why BLM adopted this divergent approach.

The state reviewed the supporting documents for the Price Field Office's evaluation of lands proposed as having wilderness characteristics. Point 5 in the Wilderness Characteristics Review form includes documentation of "all information considered during the interdisciplinary team review (*e.g.* aerial photographs, state and county road information . . . etc.)." Based on the information provided, it appears that wilderness characteristics determinations for the following areas were made without the assistance of either a site visit or review of aerial photography. Please clarify what information was considered in evaluating the following areas:

- Desolation Canyon
- Price River Extension
- Never Sweat Wash
- Lost Spring Wash
- Sweetwater Reef
- San Rafael Knob
- Molen Reef
- Eagle Canyon
- South Horn Mountain
- Wildcat Knolls Extension
- Flat Tops
- Rock Canyon

Management of lands with wilderness characteristics

The Price Field Office proposes to manage any WSAs released by Congress as lands with wilderness characteristics. *See* Supp. at 2-22. The proposed management of lands with wilderness characteristics is almost indistinguishable from Wilderness and WSA management. *See* Supp. at 2-12. Any WSA area released by Congress should be subject to multiple use management unless Congress directs otherwise. In proposing to manage any WSA released by Congress as lands with wilderness characteristics, Price Field Office not only thwarts the presumptive intent of release, but establishes *de facto* wilderness.

The Supplement contains a conclusory statement that "[e]xisting range improvement facilities within 937,000 acres of non-WSAs with wilderness characteristics were found not to detract from the natural appearance of these areas." 2007 Supp. at 4-35. Please clarify whether this statement applies to all range improvements. Please also discuss the process utilized to determine whether range improvements detract from wilderness characteristics.

The Price Field Office regularly recognizes developed infrastructure and "evidence of motorized use" within areas it considers to have wilderness characteristics. BLM Instruction Memorandum 2003-275 - Change 1 at Attachment 1 notes that "[v]isitors may have outstanding opportunities for solitude, or primitive and unconfined types of recreation . . . where the use of the area is through non-motorized, non-mechanical means." Accordingly, it appears that motorized use or evidence of motorized use is inconsistent with a finding of wilderness characteristics. While, in some instances, the existence of such features may be shielded from public view or used so infrequently that they do not interfere with naturalness, neither the EIS nor the Wilderness Characteristics Review forms upon which it is based explain how, or even if, this was considered. Please expand the discussion to indicate what evidence of human use is consistent with natural appearance and outstanding opportunities for solitude or a primitive and unconfined type of recreation.

The Supplement states that under all alternatives, approximately "70,400 acres (8 percent) would be withdrawn or recommended for withdrawal from locatable mineral entry in 22 of the 27 non-WSA lands with wilderness characteristics." Page 4-391 of the 2004 DEIS indicates that the Price Field Office will consider additional areas for withdrawals, including WSAs, suitable wild and scenic river segments, and the Three Rivers proposed withdrawal. As written, it appears that the Price Field Office proposes to undertake a separate NEPA process to "consider" additional withdrawals. *See* 2004 DEIS at 4-391. Please clarify whether this is correct and, if so, why the Price Field Office intends to segment these decisions. Please also clarify why the No Action Alternative, which reflects continuation of the current management situation, would change the management situation by recommending for withdrawal both the Cleveland-Lloyd Dinosaur Quarry and the proposed Green River withdrawals. *See* 2004 DEIS at 4-395.

Inholdings and valid existing rights within lands with wilderness characteristics

The Supplement indicates that designation of non-WSA lands with wilderness characteristics "would reduce the potential for production of oil and natural gas from public lands and could also affect the ability of the State of Utah to lease its 187,000 acres of inholdings." 2007 Supp. at 4-5. The Supplement also states that management under Alternative E could render these state lands "uneconomic to lease." *Id.* at 4-31.

State trust lands were granted to Utah, under the Utah Enabling Act, to provide for the support of schools and other beneficiary institutions. As such, the School and Institutional Trust Lands Administration is obligated to manage State Trust Lands to maximize both income for current beneficiaries and preservation of trust assets for future beneficiaries. Accordingly, the State of Utah vigorously objects to any action by the Price Field Office that restricts the School and Institutional Trust Lands Administration's ability to maximize benefits for trust beneficiaries. This includes management of non-WSA lands with wilderness characteristics that in any way infringes upon Utah's reasonable access to state inholdings within non-WSA lands with wilderness characteristics. This also includes leasing determinations for lands adjacent to state inholdings that prevent economically viable field development.

The Price Field Office should clearly and unequivocally state that management of lands with wilderness characteristics will not limit or otherwise interfere with the State's ability to construct and maintain reasonable road and necessary utility access sufficient to commercially develop state inholdings. The Price Field Office should also consider NSO stipulations. An NSO stipulation would provide appropriate resource protection while also allowing mineral access from drill platforms on school lands.

Please carefully explain how the Price Field Office would administer existing leases while managing to protect wilderness characteristics. Please also explicitly state whether the Price Field Office intends to allow lease renewal for existing leases within non-WSA lands with wilderness characteristics. These issues are critically important since the supplement indicates that over 26,000 acres of lands with wilderness

characteristics are currently leased for oil and gas development, and that development of valid existing rights could disturb about 1,400 acres of these lands. 2007 Supp. at 4-31. The Supplement also notes that 3,500 acres of the Turtle Canyon lands with wilderness characteristics area are currently under coal leases. 2007 Supp. at 4-47.

Vegetation within lands with wilderness characteristics

Please clarify what management actions would be utilized to manage for priority vegetation communities and for insect pest control within wilderness characteristics areas. *See generally*, 2007 Supp. at 2-6 and 2-7.

The Supplement also notes that a Forest and Woodlands Management Plan would be created under all alternatives. 2007 Supp. at 2-13. Please clarify what management actions would be authorized within wilderness characteristics lands under a Forest and Woodlands Management Plan.

Minerals within lands with wilderness characteristics

The supplement indicates that "about 26,000 acres of oil and gas and 3,500 acres of coal leases occur in non-WSA lands with wilderness characteristics." 2007 Supp. at 4-4. The supplement also indicates that "large portions" of 11 areas identified as lands with wilderness characteristics have moderate to high potential for locatable mineral occurrence and that 92 percent of lands with wilderness characteristics would remain open to locatable mineral entry. 2007 Supp. at 4-51. Similarly, the supplement notes that "the life of the proposed Lila Canyon coal mine would be shortened because the additional reserves are in non-WSA lands with wilderness characteristics and would be unavailable for leasing." 2007 Supp. at 4-65.

Please clarify how - *if* BLM chooses to manage discrete areas of lands with wilderness characteristics for protection of wilderness character - it would manage development of existing leases within these lands. Please explain how mineral location and development would be managed to avoid conflicts with wilderness character. Please also clarify the extent to which the owner of mineral rights within areas with wilderness characteristics would be able to construct, maintain, and use roads and other facilities necessary to develop their mineral rights. Would this differ between leases issued before and after adoption of the RMP and if so, how? Finally, please carefully analyze and discuss the extent to which precluding coal development within this area would impact the economic viability and operations of coal mining on nearby state lands as well as social and economic impacts to the state and counties.

As noted above, the state does not support creation of management prescriptions specific to lands with wilderness characteristics. However, if the BLM chooses to proceed with such an approach, the state strongly encourages BLM to manage for multiple uses where development of valid existing rights would conflict with protection of wilderness character.

Travel management & OHV use within lands with wilderness characteristics

The supplement states that "[w]ithin the San Rafael Motorized Route Designation Plan Area, 210 of the 677 miles of designated OHV routes would be closed in 21 of the 27 non WSA lands with wilderness characteristics." 2007 Supp. at 4-30. This appears to conflict with page 2-12 which states that all routes within lands with wilderness characteristics would be closed to OHV use. Please clarify whether OHV use would be allowed within any lands with wilderness characteristics, and if so, which areas and routes. Please also carefully evaluate the impact of OHV use on the existence of wilderness characteristics.

The supplement discloses that the presence of "vehicles, and equipment" within lands with wilderness characteristics, and near cultural or paleontological sites, may impact these sites and reduce opportunities for solitude. 2007 Supp. at 4-13 – 4-14. The existence of vehicles and equipment, except for maintenance of existing facilities, appears to be prohibited within lands with wilderness characteristics. 2007 Supp. at 2-12 – 2-13. Please clarify what vehicle and equipment uses are allowed within and/or are anticipated to interfere with sites or solitude within lands with wilderness characteristics.

Special Management Areas and lands with wilderness characteristics

There appears to be numerous overlapping special management areas, creating redundancy between ACECs, SRMAs, WIAs, etc. *See e.g.* 2007 Supp. at 4-59 ("[a]proximately 275,000 acres (32 percent) of ACECs are within the Non-WSA Lands with wilderness characteristics areas.") While understanding that some overlap is likely to occur at the inventory phase, the state is generally opposed to the establishment of ACECs over Wilderness Study Areas, or any layering of restrictive land use designations unless clearly necessary. The state also does not favor ACECs that exceed the scope of the resources they are designed to protect.

The state recommends the Record of Decision carefully limit the geographic extent of ACECs to include only those lands necessary for protection of identified critical resource(s). The state also recommends that the Record of Decision apply only those management requirements necessary to protect resources, avoiding application of redundant management prescriptions.

Comments Specific to areas identified as lands with wilderness characteristics:

Never Sweat Wash and Lost Spring Wash

Please clarify the Price Field Office's basis for concluding that these areas possess an appearance of naturalness and opportunities for solitude and primitive/unconfined recreation despite containing numerous ATV, motorcycle and jeep trails throughout the unit, organized motorcycle events, the proposed Chimney Rock Trail System, drift and boundary fences, stock ponds and water developments. *See* Wilderness Characteristics

Review for Never Sweat Wash at 2-3 and Wilderness Characteristics Review for Lost Spring Wash at 2-3.

Please also clarify why the maps attached to the Wilderness Characteristics Review forms show far fewer routes than Emery County's evaluation of BLM designated lands with wilderness characteristics. Were all Emery County routes evaluated and considered in the wilderness characteristic analysis?

Eagle Canyon

Based on the Price Field Office's Wilderness Characteristic Review Form and Evaluation of New Information Suggesting that an Area of Public Lands Has Wilderness Characteristics form, it appears that the Price Field Office did not conduct a site visit, review aerial photographs or state and county road information, or otherwise independently evaluate the existence of wilderness characteristics. However, the Price Field Office was able to conclude only that "there is a *reasonable probability* the Eagle Canyon proposed wilderness unit *'may have'* wilderness character." (emphasis added). The area is included in the Supplement and identified as possessing wilderness characteristics. *See* 2007 Supp. at 2-4. Please explain the Price Field Office's basis for now concluding that this area does in fact possess wilderness characteristics.

Flat Tops

In the Wilderness Characteristic Review Form and Evaluation of New Information Suggesting that an Area of Public Lands Has Wilderness Characteristics form, the Price Field Office concedes that the "BLM did not conduct an Intensive Inventory of the lands comprising UWC's Flat Top Unit . . . [t]he lands covered by the UWC Flat Tops unit was not included in the recent BLM wilderness re-inventory effort." BLM also noted that it "does not have a current road/way analysis on the condition of the vehicle routes." The Price Field Office also described the opportunities for solitude and primitive recreation as "not outstanding." Based on this limited information, the Price Field Office concluded "there is a *reasonable probability* that the area(s) in question (*or a significant portion(s) thereof*) *may have* wilderness characteristics." (emphasis added). However, the area is included in the Supplement and identified as possessing wilderness characteristics. *See* 2007 Supp. at 2-4. Please explain what additional investigations the Price Field Office undertook and how these establish the existence of wilderness character.

Molen Reef

The Price Field Office's Evaluation of New Information Suggesting that an Area of Public Lands has Wilderness Characteristics form states "there is a *reasonable probability* that the area(s) in question (*or a significant portion(s) thereof*) *may have* wilderness characteristics." (Emphasis added). This conclusion appears to be solely "[b]ased on the information SUWA provide[d]." The area is included in the EIS and identified as possessing wilderness characteristics. *See* 2007 Supp. at 2-4. Please discuss

the steps the Price Field Office undertook to determine that the area does in fact possess wilderness character. Specifically, please explain whether the Price Field Office conducted a site visit, reviewed aerial photographs, reviewed state and county road information, or took any other steps to independently evaluate the existence of wilderness characteristics.

The Evaluation of New Information Suggesting that an Area of Public Lands has Wilderness Characteristics form also noted that in 1979, the BLM did not consider either the opportunities for solitude, or the opportunities for primitive recreation to be outstanding. Please explain how these opportunities have changed to support the existence of wilderness character.

Rock Canyon

The Price Field Office's Evaluation of New Information Suggesting that an Area of Public Lands Has Wilderness Characteristics form notes that the "Rock Canyon proposed wilderness unit *may* have wilderness character. The BLM believes that further consideration of the wilderness character of this unit is warranted." (Emphasis added). Rock Canyon is included in the EIS and identified as possessing wilderness characteristics. *See* 2007 Supp. at 2-4. Please identify and discuss all additional investigations BLM conducted to determine that the Rock Canyon area possesses wilderness characteristics.

South Horn Mountain

The Wilderness Characteristics Review form for this unit notes that the "sites and sounds of man's activities are easily observed from within this unit. Opportunities for solitude may be limited to isolated canyon locations, only." Please reconcile this statement with the requirement for outstanding opportunities for solitude or primitive and unconfined recreation.

Wild Horse Mesa

Based on the Price Field Office's Wilderness Characteristic Review Form and Evaluation of New Information Suggesting that an Area of Public Lands Has Wilderness Characteristics form, the Price Field Office concluded that "there is a *reasonable probability* that the area(s) in question (*or a significant portion(s) thereof*) *may have* wilderness characteristics." (Emphasis added). The area is included in the Supplement and is identified as possessing wilderness characteristics. *See* 2007 Supp. at 2-4. Please explain what additional investigations the Price Field Office undertook and how these establish the existence of wilderness character.

ATTACHMENT B

ATTACHMENT B

Utah Public Lands Study – Key Social Survey Findings for Carbon and Emery Counties

A statewide social survey was conducted by Utah State University in 2007 to assess the ways in which Utah residents use and value public land resources, and their views about public land management. Random samples of residential households were selected in each of the state's 29 counties. Sampled households were contacted by mail, and a randomly-selected adult from the household was asked to participate in the survey. Self-completion questionnaires were distributed to potential survey participants using a multiple-wave survey administration procedure. The discussion that follows is focused on key survey results obtained for Carbon County (n = 108 survey responses) and for Emery County (n = 110 survey responses).

Economic Linkages to Public Lands

One major focus of the survey questionnaire involved assessment of the various ways in which Utahans' may engage in economic activities that are linked directly or indirectly to public land resources in the state.

Permit-Based Economic Activities

As indicated in Table 1, only a minority of survey respondents in either Carbon or Emery Counties reported that a portion of their household income is directly linked to activities that involve permitted uses of lands or resources administered by the U.S. Forest Service, the Bureau of Land Management (BLM), other federal agencies, or the State of Utah. In Carbon County reports of income derived from permit-based economic activities on public lands most often involved activities involving land administered by the Bureau of Land Management (13.3%), the State of Utah (9.7%) and the Forest Service (9.5%). In Emery County these types of economic linkage to public lands were reported most often for activities involving land administered by the Forest Service (22.2%), followed by the Bureau of Land Management (18.2%) and the State of Utah (14.7%). The percentage of respondents indicating that some portion of their household income is derived from such permit-based activities was generally higher in Emery County than was the case in Carbon County.

Table 1. Percentage of survey respondents reporting that a portion of household income is directly linked to permitted use of public lands or resources.

Agency	Carbon County	Emery County
Forest Service	9.5%	22.2%
BLM	13.3%	18.2%
Other federal agency	2.9%	0.9%
State of Utah	9.7%	14.7%

The data reported in Table 2 reflect the percentage of respondents reporting these types of permit-based economic linkages to public lands who also indicated that 25% or more of their total household income is derived from those activities. Since in many cases the number of respondents reporting such economic linkages was small, these values must be interpreted with caution. Nevertheless, it is clear that in both Carbon County and Emery County the survey respondents who did report participation in permit-based economic activities on public lands tend to rely fairly heavily on those activities as sources of total household income.

Table 2. Percentage of survey respondents reporting permit-based economic activities on public lands who indicated that 25% or more of their household income is derived from those activities.

Agency	Carbon County	Emery County
Forest Service	90.0%	78.3%
BLM	76.9%	80.0%
Other federal agency	100.0%	100.0%
State of Utah	70.0%	43.7%

Household Participation in Selected Commercial Activities

The next series of questions asked respondents to indicate whether they or members of their households participate in any of a number of commercial activities that, while commonly associated with public land use, can involve the use of either public or private lands. Results summarized in Table 3 indicate that for any of these activities only a minority of survey respondents in either Carbon County or Emery County reported participation. Among Carbon County respondents, the activities reported most frequently were participation in mining of coal, uranium or other minerals (19.2% of responses) and mining of sand, gravel or other construction materials (8.7%). In Emery County participation was reported most frequently for livestock grazing and related work (23.1% of respondents), mining of coal, uranium or other minerals (19.6%), and commercial firewood cutting (10.4%). On balance, the response patterns indicate that there is a higher level of engagement in most of these types of resource-based commercial activities among residents of Emery County than is the case in Carbon County.

Table 3. Percentage of survey respondents reporting that they or members of their households participate in selected resource-based commercial activities, on either public or private lands.

Economic Activity	Carbon County	Emery County
Livestock grazing and related work	1.0%	23.1%
Commercial firewood cutting	3.8%	10.4%
Logging, post & pole cutting, or other timber-related work	0.0%	4.7%
Mining of coal, uranium or other solid minerals	19.2%	19.6%
Mining of sand, gravel, or other construction materials	8.7%	4.7%
Oil and gas exploration and development	5.9%	6.7%
Operating an outfitting or guiding business	0.0%	2.9%
Film making/commercial photography	3.8%	1.9%
Other commercial activities	0.0%	2.0%

Household Involvement in Businesses Linked to Recreation/Tourism

Survey respondents were also asked whether they or any member of their household operates or works at a business linked to recreation or tourism activity that is influenced by the presence of public lands and resources. Very few survey respondents from either Carbon County (8.3%) or from Emery County (5.6%) said "yes" to this question. When asked to assess how important activities and uses linked to public lands are to the success of this business, one third (33.3%) of Carbon County respondents and one-half (50.0%) of San Juan County respondents who did report involvement in such businesses said that the influence of public lands is "extremely important."

Household Involvement in Businesses Linked to Commodity Production

A similar question asked about the involvement of survey participants and members of their households in business that provide services and supplies to farming or ranching operations, logging firms, or other commercial enterprises that use or process natural resources located on public lands. The percentage of respondents reporting participation by a household member in such businesses was fairly low in both Carbon County (11.2%) and in Emery County (14.8%).

Ownership of Property or Assets With Values Influenced by Nearby Public Lands

When asked whether they own land, buildings, or other assets that they believe have a monetary value that is significantly influenced by the presence and condition of nearby public lands, 15.1% of Carbon County respondents and 26.9% of Emery County respondents said "yes." Those who did perceive the existence of such a relationship were then asked to identify specific types of assets that they own and that they believe have a value influenced by the close proximity of public lands. Respondents in both counties most frequently cited their permanent residential property (9.3% in Carbon County, 15.5% in Emery County) and water rights (cited by 6.5% of respondents in Carbon County and 10.0% of respondents in Emery County).

Perceived Importance of Public Lands for Overall Quality of Life

Survey participants were also asked to report how important they think fifteen different types of public land resources and resource uses are for the overall quality of life experienced by people living in their communities. Table 4 summarizes response patterns to this series of questions for Carbon and Emery Counties, with a focus on the percentage of respondents from each county who indicated that they consider a particular type of resource use to be "very important" for local quality of life.

In Carbon County five of the fifteen types of public land resource use presented in this question were considered "very important" by fewer than one-half of respondents (grazing of livestock,

Table 4. Percentage of survey respondents indicating that selected public land resource uses are "very important" to the overall quality of life in their community.

Resource Use	Carbon County	Emery County
Grazing of livestock on public lands	47.0%	77.5%
Water resources used to irrigate crops and pastures	79.8%	96.2%
Water resources used to supply homes and businesses	93.3%	99.0%
Water resources that provide important fish/wildlife habitat	75.7%	76.0%
Energy resources such as oil, gas, coal or uranium	79.6%	71.4%
Sand, gravel or other minerals used in building and construction industries	38.6%	41.4%
Forested areas that provide timber used by logging operations and lumber mills	29.0%	39.0%
Areas where trees or other vegetation provide important wildlife habitat	69.2%	69.2%
Areas that attract tourism and recreational activity	57.3%	54.4%
Opportunities to enjoy off-road vehicles, snowmobiling, or other motorized recreation	58.3%	69.3%
Opportunities to enjoy hiking, backpacking, cross-country skiing, horseback riding, or other types of non-motorized recreation	55.3%	64.1%
Opportunities to hunt for wild game	57.3%	70.2%
Opportunities to fish in area lakes, streams and rivers	69.2%	77.9%
Undeveloped landscapes where motorized access and resource development are restricted	31.6%	31.6%
Areas managed to maintain biodiversity and protect habitat for sensitive or important plants or wildlife	46.4%	32.0%

sand/gravel or other construction-related mineral development, timber production, undeveloped landscapes where motorized access and development are restricted, and areas managed to maintain biodiversity and protect plant or wildlife habitat). At the same time, over three-fourths of Carbon County respondents considered water resources used to irrigate crops and pastures, water resources used to supply homes and businesses, water resources used to supply fish and wildlife habitat, and energy resources such as oil, gas, coal or uranium to be "very important" to the local quality of life.

In Emery County only four of these resource uses were considered "very important" by fewer than one-half of respondents (sand/gravel or other construction-related mineral development, timber production, undeveloped landscapes where motorized access and resource development are restricted, and areas managed to maintain biodiversity and to protect habitat). Conversely, five resource uses – grazing of livestock on public lands, water resources used to irrigate crops and pastures, water resources used to supply homes and businesses, water resources used to provide important fish and wildlife habitat, and opportunities to fish in area lakes, streams and rivers -- were considered "very important" to the local quality of life by more than three-fourths of Emery County respondents.

Recreational Uses of Public Lands

Survey participants were also asked to report whether they had participated in any of a broad range of outdoor recreation activities and other non-commodity use activities on Utah public lands during the prior twelve months. Results from this series of questions are reported in Table 5 and Table 6. These findings clearly indicate that there is widespread participation in many of these public land activities among residents of both Carbon County and Emery County.

Table 5 reports the extent of reported participation in thirty different outdoor recreation activities. Among survey participants living in Carbon County, more than one-half reported participation in nine of these activities -- camping, picnicking, day hiking, wildlife viewing, hunting, fishing, visiting historical sites, ATV riding, and driving for pleasure/sightseeing on public lands -- during the preceding twelve months. In Emery County over half of respondents reported that they had participated in these same nine activities, as well as in 4-wheel driving.

Responses to a question focusing on participation in a variety of non-commodity use activities on public lands are summarized in Table 6. Among this list of activities, Carbon County respondents were most likely to report that they participate in collection of rocks for home landscaping, collecting materials for craft projects, collecting fossils, rocks or other minerals, and gathering pinyon nuts. In Emery County, respondents most frequently reported that they cut Christmas trees, collect fossils, rocks or other minerals, collect rocks for home landscaping, and collect firewood for home use.

Respondents were also asked to identify the one or two activities from the lists presented in these questions that they participate in most often, and to provide detail on where they engage in those activities. Among Carbon County respondents the first of these activities listed by respondents most often involved camping (31.6% of responses), followed by fishing (12.6%) and ATV riding (11.6%). In Emery County the first listed activity most often involved camping (26% of responses), followed by fishing (13.5%), ATV riding (13.5%) and hunting (11.5%). When asked

Table 5. Percentage of survey respondents reporting participation in selected recreation activities on Utah public lands during the past twelve months.

Activity	Carbon County	Emery County
Camping	76.4%	75.0%
Picnicking	76.9%	74.3%
Backpacking	17.7%	15.4%
Day hiking	55.8%	53.8%
Bird watching	26.3%	22.8%
Wildlife viewing	71.8%	68.2%
Nature photography	38.4%	37.9%
Canoeing/kayaking	8.6%	7.7%
River rafting	14.4%	7.7%
Motor boating	43.8%	27.9%
Jet skiing	11.8%	4.9%
Swimming	44.3%	36.5%
Rock climbing	16.5%	21.6%
Mountain climbing	21.4%	21.4%
Hang gliding	0.0%	0.0%
Mountain bike riding	20.8%	12.6%
Hunting	54.9%	57.0%
Fishing	72.5%	67.9%
Horseback riding	16.0%	35.8%
Orienteering/geo-caching	8.7%	10.0%
Rock hounding	28.1%	26.7%
Visiting historical sites	65.7%	65.7%
Resort skiing/snowboarding	9.8%	10.7%
Backcountry skiing/snowboarding	3.3%	9.8%
Snowshoeing	4.3%	6.8%
Snowmobiling	11.7%	4.9%
ATV riding	58.6%	62.0%
Dirt bike riding	12.8%	17.5%
4-wheel driving/jeeping	44.0%	52.4%
Sightseeing/pleasure driving	85.3%	86.1%

Table 6. Percentage of survey respondents reporting participation in selected non-commodity use activities on Utah public lands during the past twelve months.

Activity	Carbon County	Emery County
Collecting firewood for home use	17.3%	25.0%
Cutting Christmas trees	16.3%	26.9%
Collecting material for craft projects	28.6%	10.6%
Collecting rocks for home landscaping	31.7%	25.5%
Collecting plants for home landscaping	14.9%	12.1%
Gathering wild mushrooms	3.0%	1.9%
Gathering pinyon nuts	23.5%	17.6%
Gathering berries, herbs or wild foods	12.7%	6.6%
Collecting fossils, rocks or minerals	27.5%	26.4%

to indicate where they participate in the first-listed of their "most frequently pursued" activities, 50.6% of Carbon County respondents and 83.2% of San Juan County residents who answered the question identified a location within the county where they live.

Attitudes and Preferences Regarding Public Land Management

Two similar sets of survey questions focused on respondents' attitudes and preferences regarding the extent to which various natural resource use activities or management practices should be reduced or increased by those responsible for managing public lands in Utah. Response patterns to these questions are summarized in Table 7 and Table 8.

The data presented in Table 7 indicate that Carbon County respondents were considerably more likely to prefer an increase rather than a decrease in protection of important fish and wildlife habitat, protection of endangered species, use of controlled burns to improve ecological conditions, thinning of forested areas to reduce wildfire risk, designation of wild and scenic rivers, and development of water storage and delivery systems on Utah public lands. They were also more likely to prefer an increase in levels of mineral exploration and extraction. On the other hand, attitudes were more evenly split between preferences for reducing and preferences for increasing timber harvest levels, designation of wilderness areas, exploration for and development of oil and gas resources, and livestock grazing. Among Emery County residents respondents were more likely to prefer an increase rather than a decrease in mineral exploration/extraction, timber harvest, oil and gas development, protection of fish and wildlife habitat, use of controlled burns to improve ecological conditions, thinning of forested areas to reduce wildfire risk, livestock grazing, and development of water storage and delivery systems. They also expressed a strong preference for a reduction in the designation of wilderness areas, and were more likely to prefer a reduction as opposed to an increase in designation of wild and scenic rivers.

Results summarized in Table 8 indicate that Carbon County respondents were more likely to prefer an increase rather than a reduction in provision of road access to recreation areas, provision of hunting opportunities, development of trails for off-highway motorized recreation, development of trails for non-motorized recreation, regulations that restrict motorized vehicles to designated trails, regulations to limit noise and emissions from snowmobiles and ATVs, and development of visitor facilities that would encourage an increase in tourism levels. In Emery County respondents were far more likely to prefer an increase rather than a decrease in provision of road access to recreation areas, provision of hunting opportunities, development of trails for off-highway motorized recreation, development of trails for non-motorized recreation, regulations that require motorized vehicles to stay on designated trails, and development of visitor facilities that would encourage increased tourism.

Table 7. Survey respondents' attitudes regarding the extent to which various activities occurring on Utah public land should be reduced or increased.*

Type of use/activity	Carbon County Reduce	Carbon County Increase	Emery County Reduce	Emery County Increase
Mineral exploration/extraction	20.0%	36.0%	10.8%	46.1%
Timber harvest	25.8%	28.8%	14.0%	51.0%
Designation of wilderness areas	30.3%	33.3%	61.8%	18.6%
Exploration for/development of oil and gas resources	26.3%	33.3%	14.9%	43.6%
Protection of important fish and wildlife habitat	6.1%	60.2%	11.7%	43.7%
Protection of endangered species	14.3%	42.8%	23.8%	30.7%
Use of controlled burns to improve ecological conditions	11.5%	31.2%	13.9%	36.6%
Thinning of forested areas to reduce wildfire risk	6.2%	51.5%	6.1%	58.6%
Livestock grazing	24.4%	18.4%	12.0%	46.0%
Designation of wild and scenic rivers	13.8%	41.5%	30.9%	19.6%
Developing water storage and delivery systems to meet needs of nearby communities	5.0%	76.2%	1.0%	73.6%

* Original response categories were "major reduction" and "moderate reduction" (combined to create "reduce") and "major increase" and "minor increase" (combined to create "increase"). "Stay about the same" responses not reported here.

Table 8. Survey respondents' attitudes regarding the extent to which the emphasis placed on various activities occurring on Utah public land should be reduced or increased by public land managers.*

Type of use/activity	Carbon County		Emery County	
	Reduce	Increase	Reduce	Increase
Permitting of commercial guiding or outfitter services	18.9%	16.7%	21.0%	25.0%
Providing road access to recreation areas	9.8%	48.1%	7.7%	59.6%
Providing hunting opportunities	6.9%	59.4%	7.8%	54.4%
Developing trails for off-highway motorized recreation	23.3%	51.5%	23.1%	61.6%
Developing trails for hiking, biking, and other non-motorized recreation	7.8%	57.3%	16.3%	56.7%
Regulations that require motorized vehicles to stay on designated trails	20.2%	52.9%	21.4%	46.6%
Regulations that limit levels of noise and emissions from snowmobiles and ATVs	19.6%	39.2%	25.0%	32.7%
Developing visitor facilities to increase tourism	8.6%	52.4%	13.5%	54.8%

* Original response categories were "major reduction" and "moderate reduction" (combined to create "reduce") and "major increase" and "minor increase" (combined to create "increase"). "Stay about the same" responses not reported here.

ATTACHMENT C

ATTACHMENT C

The Structure and Economic Impact of Utah's Oil and Gas Exploration and Production Industry Phase I - The Uinta Basin

Prepared for:

Public Land Policy Coordination Office
Utah Governor's Office
5110 State Office Building
P. O. Box 141107
Salt Lake City, Utah 84114

Prepared by:

Bureau of Economic and Business Research
University of Utah
1645 East Campus Center Drive
Salt Lake City, Utah 84112

November 2007

Table of Contents

List of Tables

List of Figures

List of Acronyms & Abbreviations

BCF	Billion Cubic Feet
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
DOGM	Utah Division of Oil, Gas and Mining
E&P	Exploration and Production
IPAMS	Independent Petroleum Association of the Mountain States
MCF	Thousand Cubic Feet
MMCF	Million Cubic Feet
NAICS	North American Industry Classification System
NYMEX	New York Mercantile Exchange
PADD	Petroleum Administration for Defense District
SIC	Standard Industrial Codes
SITLA	School and Institutional Trust Lands Administration
RIMS II	Regional Input-Output Modeling System
UDOT	Utah Department of Transportation
USFS	U.S. Forest Service
WTI	West Texas Intermediate Crude

The Structure and Economic Impact of Utah's Oil and Gas Industry

1 Executive Summary

The Bureau of Economic and Business Research at the University of Utah has completed an economic impact study of the oil and gas exploration and production industry in the Uinta Basin in eastern Utah. The Uinta Basin, comprising Duchesne and Uintah Counties, is the center of the oil and gas industry in Utah. Rapidly rising energy prices in recent years have stimulated greater production of both crude oil and natural gas in the northern Rocky Mountains, and the Uinta Basin is an integral part of the oil and gas industry in the Rocky Mountain area. The 2006 crude oil production in the Uinta Basin of 11.4 million barrels was a 55 percent increase over a recent low of 7.3 million barrels in 2002. Natural gas production in the area has steadily increased over the past 10 years and reached an all-time high of 226 BCF in 2006.

The rise in oil and gas activity is causing an economic boom in the Uinta Basin. During 2006, the oil and gas exploration and production industry was directly responsible for 19.9 percent of employment and 34.8 percent of total wages in the Uinta Basin. When including indirect and induced impacts due to company and employee spending, the oil and gas industry accounted for 49.5 percent of employment and 60.1 percent of total wages paid in the Uinta Basin during 2006.

The industry also has a sizeable fiscal impact on local governments in the Uinta Basin. Property taxes paid on producing oil and gas wells were $18.2 million in 2006 and accounted for 38.7 percent of all property taxes paid in the two counties. Federal mineral royalties distributed to the two counties by the Utah Department of Transportation during 2006 amounted to $30.3 million.

2 Background

The recent rise in the price of gasoline has refocused attention on the energy markets with attention not seen since the collapse of oil prices in the mid 1980s. In contrast to the energy shortage of the 1970s, which was largely driven by constrained supply due to geopolitical issues, the recent runup is a result of increasing demand and decreasing supply from aging fields. Crude oil, and to a lesser extent natural gas, is a worldwide commodity with international supply and demand factors determining prices. Consumption of petroleum products is up worldwide, with developing countries driving the increase. Consumption of petroleum in China was up over 30 percent from 2002 to 2006. This rise in demand for petroleum products has resulted in a dramatic increase in the nominal price of crude oil (Figure 1).

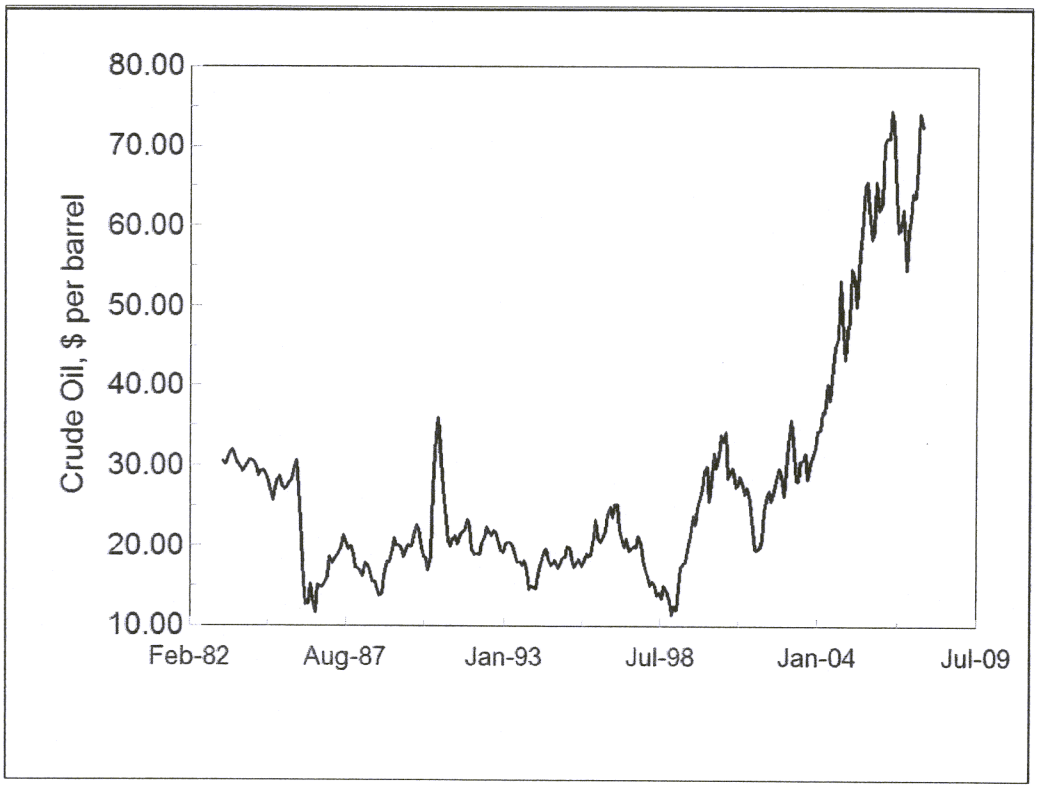


Figure 1 **Crude Oil Price: NYMEX Near Month Contract for Light Sweet Crude**
Source: Energy Information Administration

The price of crude oil was relatively flat during the 1990s with prices in the $20 to $30 range. Then, from a low of $11.31 per barrel in December 1998, crude oil increased to over $70 per barrel in April 2006 and reached $79.63 in September

2007. Forecasts expect the crude oil price to remain near current levels in the future. In September 2007 the Energy Information Administration forecast the price of West Texas Intermediate Crude[1] would remain over $71 per barrel through the end of 2008.

At the same time, natural gas prices have increased from historically low values in the late 1990s to a current price of about $7 per mcf, with increased volatility in recent years (Figure 2). Natural gas is more of regional commodity than crude oil, with more dependence on local supply and demand factors. The necessity of transporting natural gas by pipeline results in availability of transportation infrastructure having a large influence on natural gas prices. Currently, there is a shortage of pipeline capacity in the Rocky Mountains and wellhead natural gas prices in the area are depressed compared to the rest of the country.

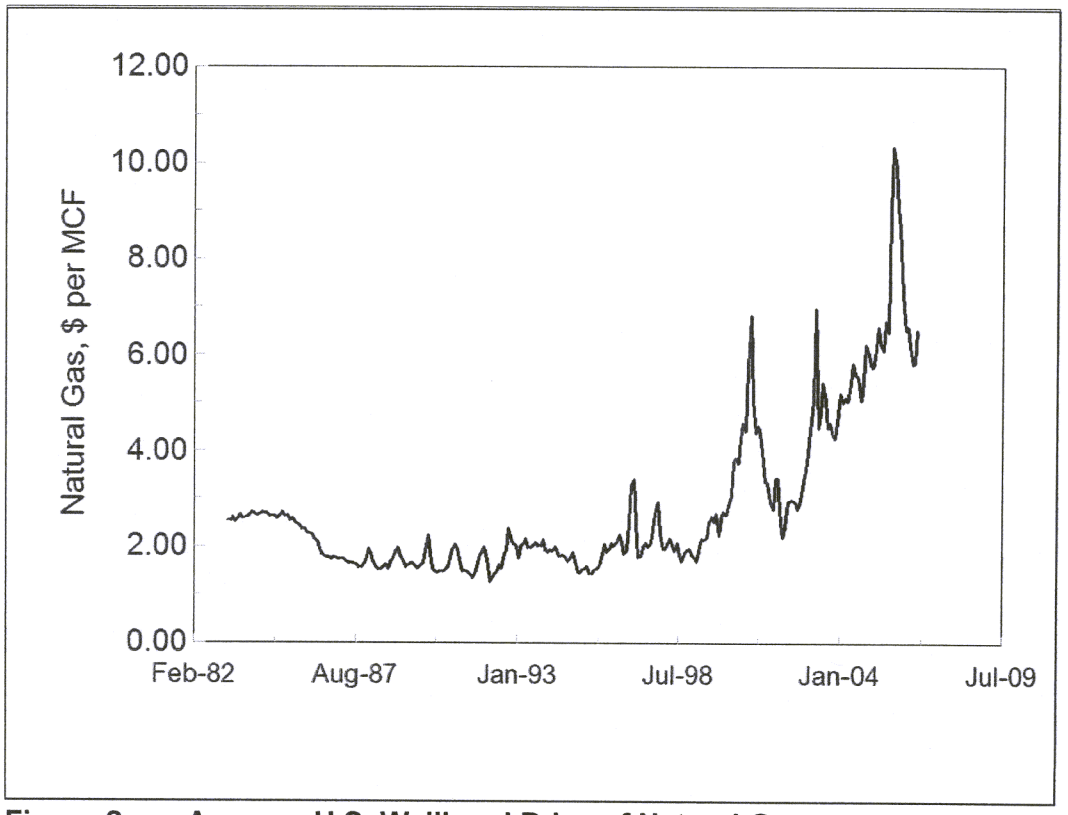


Figure 2 **Average U.S. Wellhead Price of Natural Gas**
Source: Energy Information Administration

[1]West Texas Intermediate (WTI) refers to a crude stream produced in Texas and Oklahoma that is the most common reference or "marker" for pricing crude oil and, along with several other domestic and foreign crude streams, is acceptable for settling New York Mercantile Exchange contracts for light, sweet crude oil.

While increased demand in the Pacific Rim has driven petroleum prices, demand has also increased in the U.S. Domestic crude oil production has declined from a high value of 3.5 billion barrels in 1970 to 1.9 billion barrels in 2006. Even with additional drilling in response to higher prices, domestic crude oil production is dropping due to geologic constraints. The Rocky Mountain states are the only area in the country currently experiencing significant increases in production of crude oil and natural gas. Of the five Petroleum Administration for Defense Districts (PADD) (Figure 3) used for analyzing petroleum data, crude oil and natural gas production are increasing only in PADD I (the East Coast) and in PADD IV (the Rocky Mountains).

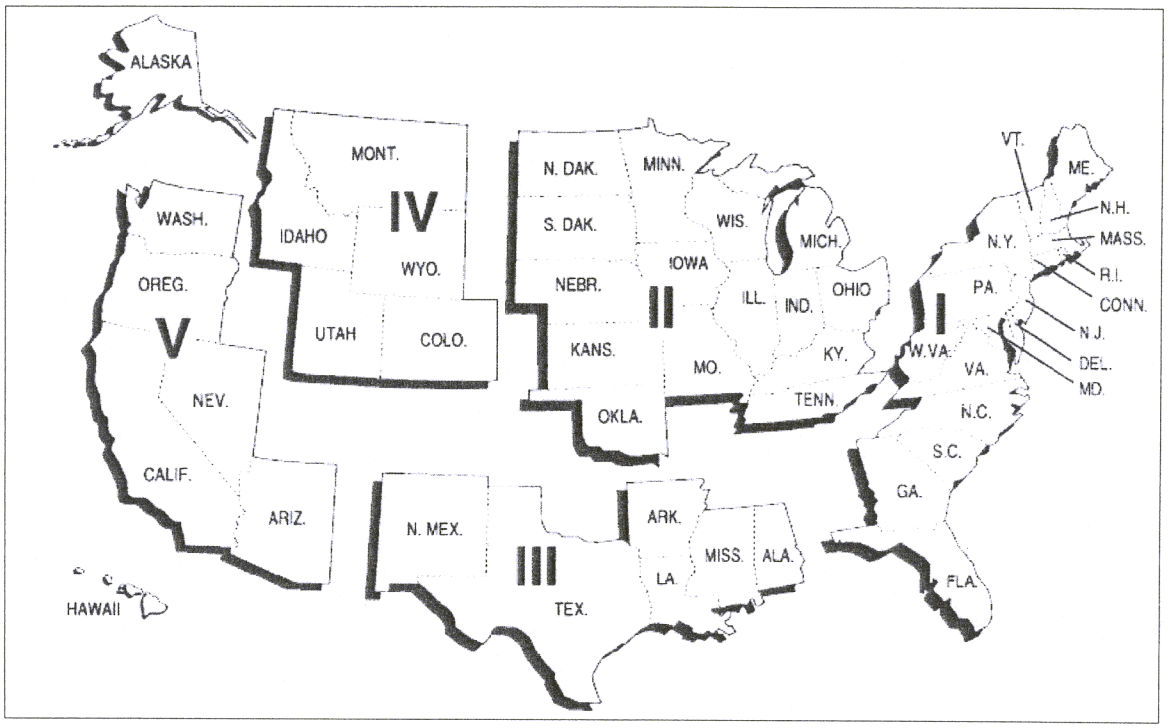


Figure 3 **Petroleum Administration for Defense Districts (PADD)**
Source: Energy Information Administration

The East Coast is responsible for less than one-half of one percent of domestic crude oil production and three percent of natural gas production. From 2002 to 2005, the amount of crude oil produced in the Rocky Mountains increased by 20.4 percent while production on the Gulf Coast (PADD III), the largest producing area in the country, dropped by 12.8 percent. The center for production of natural gas in the United States is also shifting from the Gulf Coast to the Rocky Mountains. In 1982, PADD III was responsible for 75.5 percent of U.S. natural gas production and PADD IV produced 4.2 percent. By 2005, the amount of domestic gas produced in PADD III had dropped to 62.5 percent of total production while the amount from

PADD IV had increased to 17.0 percent. Additionally, natural gas production in the Rocky Mountains is increasing approximately five percent annually. The increase in crude oil and natural gas production in the Rocky Mountain states is creating an economic boom in the producing areas.

Table 1 U.S. Crude Oil and Natural Gas Production by PADD, 2002-2005

	PADD I	PADD II	PADD III	PADD IV	PADD V	United States Total
Crude Oil, thousand barrels						
2002	7,458	164,635	1,174,305	102,982	947,745	2,097,124
2003	7,170	161,360	1,162,869	105,931	636,123	2,073,453
2004	6,941	159,309	1,103,743	113,069	600,239	1,983,302
2005	8,299	161,587	1,023,499	123,956	572,765	1,890,106
Percent Change, 2002-2005	11.3	(1.9)	(12.8)	20.4	(39.6)	(9.9)
Dry Natural Gas, MMCF						
2002	453,774	2,432,537	12,622,766	2,641,749	776,962	18,927,788
2003	521,824	2,336,271	12,662,381	2,797,202	780,866	19,098,544
2004	520,240	2,428,676	11,960,955	2,935,503	745,517	18,590,891
2005	522,997	2,413,736	11,298,362	3,075,234	763,907	18,074,237
Percent Change, 2002-2005	15.3	(0.8)	(10.5)	16.4	(1.7)	(4.5)
Source: Energy Information Administration						

Despite the common perception of being vertically integrated, the oil and gas industry is highly fragmented, especially at the exploration and production stage. Many companies concentrate exclusively on oil and gas production and have no interest in downstream operations such as pipelines, refineries and product distribution. Additionally, much of the work conducted in the producing fields is contracted to other companies that specialize in different aspects of drilling and maintaining the wells. Few of the operating companies operate their own drill rigs but instead contract with companies that specialize in drilling. Other companies specialize in different operations such as grading well locations, well surveying, running and pulling well casings, cementing wells, and perforating well casings. The operating, drilling and service companies collectively constitute the oil and gas exploration and production industry.

Many other industries benefit from spending by the oil and gas industry. These include consulting geologists and engineering companies, environmental consultants, vendors of oil field equipment and pipeline and trucking companies. Spending by oil industry employees also benefits the local economy. These economic benefits beyond direct employment in the exploration and production industry are known as indirect and induced benefits, and are the source of the "multiplier" effect. This study examines the structure of the Utah oil and gas

exploration and production industry and the total economic impact on the producing areas.

3 Utah's Oil and Gas Industry

The Utah oil and gas industry started in 1891, when a water well being drilled in Farmington Bay near the Great Salt Lake encountered natural gas at a depth of 1,000 feet. Gas from several wells in this area was transported to Salt Lake City through wooden pipelines for several years until shifting sand in the lakebed plugged the wells. The first oil was found in the early 1900s near Rozel Point at the north end of the Great Salt Lake, near Mexican Hat in southeastern Utah and near the town of Virgin in southwestern Utah. The first large-scale commercial oil well was drilled near Vernal in 1948. Since the early 1960s, Utah has consistently ranked in the top 15 oil-producing states and in recent years has experienced a dramatic rise in natural gas production. During 2005, Utah ranked 15th in crude oil production out of 31 states and two Federal Offshore Areas and 11th in dry natural gas production out of 33 states and the Federal Offshore Area in the Gulf of Mexico.

Utah is contributing to the recent growth in crude oil and natural gas production taking place in the Rocky Mountain states (PADD IV). The state's 2006 crude oil production of 17.9 million barrels was a 37 percent increase over the recent low of 13.1 million barrels produced in 2003 (Figure 4). Although a substantial increase from the recent past, 2006's output was still only 44 percent of the all-time high of 41.1 million barrels produced in 1985.

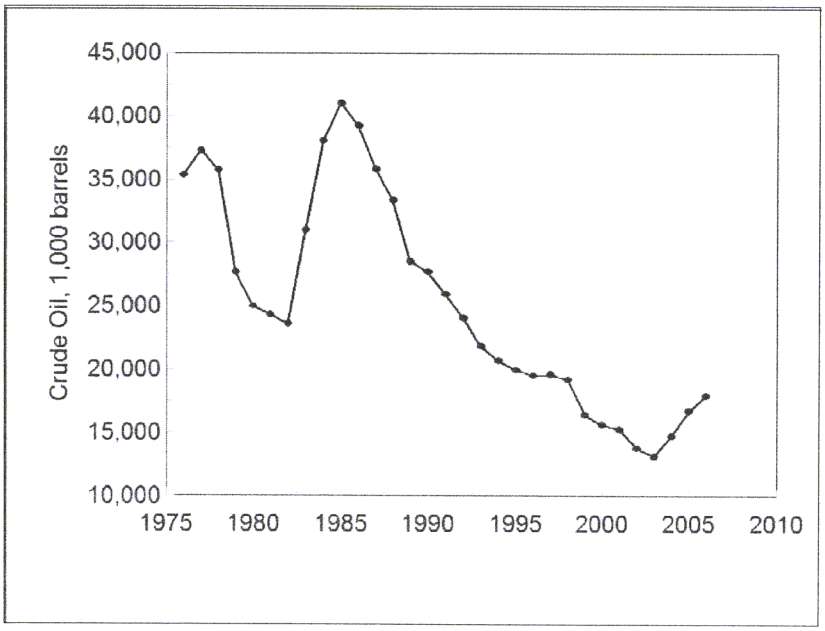


Figure 4 **Utah Crude Oil Production**
Source: Utah Division of Oil, Gas and Mining

There has been a similar rise in natural gas production in Utah. In 2006, Utah's marketed natural gas production hit an all-time high of 343 BCF, up 502 percent from 57 BCF in 1976.

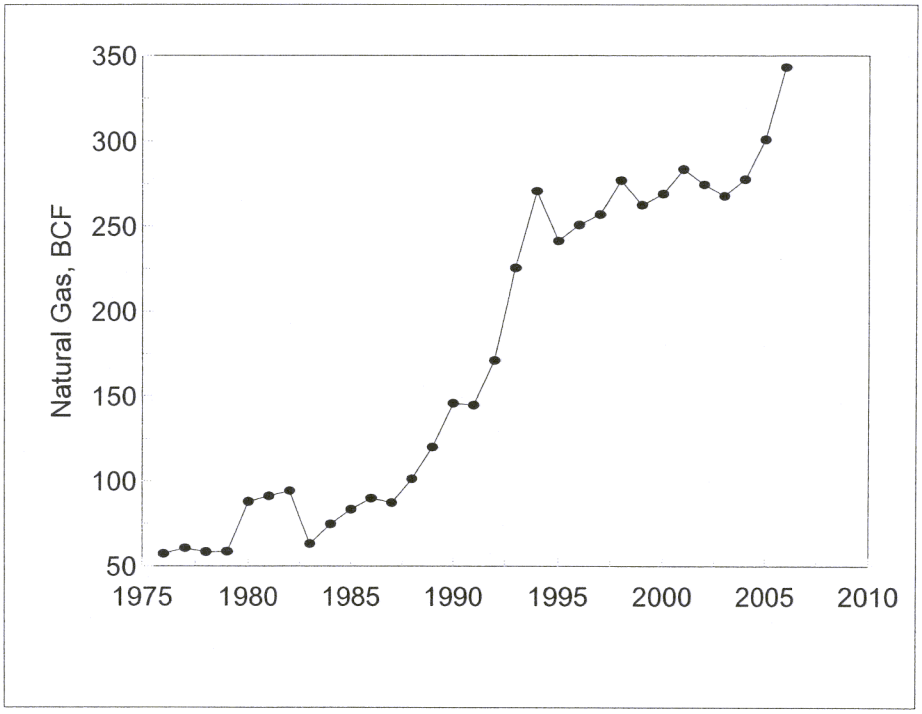


Figure 5 **Utah Marketed Natural Gas Production**
Source: Utah Geological Survey

Not all gross withdrawals of natural gas are marketed to consumers. Low prices of natural gas during the late 1980s and early 1990s resulted in much of the gas produced in Utah at the time not being marketable. A large portion of the gas withdrawn from wells in Utah during this period was reinjected into the geologic formations to maintain pressure and oil production. The amount of gas used for repressuring in Utah reached a high in 1983, when 65 percent of gross withdrawals were reinjected to maintain pressure. Currently, approximately 95 percent of natural gas withdrawals in Utah are marketed. Most of the gas that is not marketed is used for fuel at the production site or is accounted for by nonhydrocarbon gases that are removed from the production stream prior to marketing.

Average production per well of both crude oil and natural gas has been declining in Utah, so additional drilling will have to continue to maintain production at current levels. Although natural gas production has been steadily rising and crude oil production in Utah has rebounded in recent years, production per individual well has been declining. Natural gas production per gas well peaked at 740 MMCF per gas

well in 1962. Natural gas production per gas well steadily declined to 67 MMCF per well in 2000 before rising to 84 MMCF per well in 2006. Similarly, crude oil production per oil well peaked at 57,330 barrels per well in 1959 and dropped to 6,727 barrels per well in 2003. Crude oil production per well in Utah was 7,308 barrels during 2006.

During 2006, 129 different operating companies reported crude oil and natural gas production to the Utah Division of Oil, Gas and Mining. Production occurred in 11 of Utah's 29 counties. Duchesne County had the highest oil production with 6,401,299 barrels while Uintah County led natural gas production with gross withdrawals of 203,522,421 MCF.

Six different areas in Utah currently have significant production of oil or natural gas. These areas are defined by geology. Additionally, these areas are somewhat isolated from one another economically, especially in terms of the oil and gas exploration and production (E&P) industry. The major oil and gas producing area in Utah is the Uinta Basin in the northeastern part of the state. Vernal is a center of the oil and gas industry in the Uinta Basin with many of the producing, drilling and service companies maintaining offices in the area. Other producing areas in Utah include coalbed methane plays in Carbon and Emery Counties, the Paradox Basin in San Juan County, the Uncompahgre Uplift in Grand County, the Thrust Belt in Summit County and the recently discovered Hingeline in the central part of the state.

The Paradox Basin, Uncompahgre Uplift, and Thrust Belts all extend over state lines to adjacent states. Many of the workers involved in operating wells in these areas are actually employed in other states. Coalbed methane operations in Carbon and Emery Counties and the Hingeline are fairly recent discoveries and an oil service industry has not developed in these areas.

Defining the oil and gas E&P industry is a key element for a study of this type. Economists use the North American Industry Classification System (NAICS) developed by the Office of Management and Budget for classifying industries for reporting employment and earnings. The NAICS codes are divided into 20 major industrial sectors. These major sectors are then further subdivided as necessary.

The NAICS codes have three industrial classifications that directly apply to the oil and gas E&P industry. These are NAICS 211 - Oil and Gas Extraction, NAICS 213111 - Drilling Oil and Gas Wells, and NAICS 213112 - Support Activities for Oil and Gas Operations. For purposes of this study, these three industries are collectively considered the oil and gas E&P industry. Additional information on the NAICS codes for these three industries is available in Section 6.

The following section summarize oil and gas production in Duchesne and Uintah Counties. Also included are economic data for Duchesne and Uintah Counties to place the oil and gas E&P industry in context.

3.1 Uinta Basin

The Uinta Basin in northeastern Utah is the largest oil and gas producing area in the state and a significant producer in the Rocky Mountains. Natural gas was first discovered in economic quantities in the Uinta Basin in 1925 at the Ashley Valley field. In 1949, oil was discovered in the Roosevelt field. Natural gas and crude oil have been produced in the Uinta Basin since then, although production and the accompanying economic impact have varied with prices. The Uinta Basin is currently experiencing a significant economic boom due to increased oil and gas activity. This boom should continue as long as energy prices remain at current or higher levels.

Although the geologic area defined as the Uinta Basin extends into Colorado and includes portions of several other Utah counties (Carbon, Emery, Grand, Wasatch, and Utah), this study focuses on Duchesne and Uintah Counties, Utah. Economic data is released at the county level and almost all of the economic activity associated with E&P activities in the Uinta Basin occurs in these two counties. For this study, the term Uinta Basin refers to Duchesne and Uintah Counties, collectively unless otherwise indicated.

The two counties contain just under five million acres (Table 2), with 54 percent of the land controlled by the federal government. After including land controlled by the state government and Indian lands, only 21.8 percent of the Uinta Basin is privately owned. With such a large portion of the land controlled by the federal government, the oil and gas E&P industry is highly sensitive to changes in federal land management policy. The largest amount of federal land in the Uinta Basin is controlled by the Bureau of Land Management, which is responsible for 32.7 percent of the land in the two counties. An additional 14.6 percent is administered by the U.S. Forest Service. Lesser amounts are controlled by the U.S. Fish and Wildlife Service and the National Park Service.

The majority of the state land in the basin is controlled by the Utah School and Institutional Trust Lands Administration (SITLA). SITLA administers six percent of the land in the two counties. Lesser amounts are controlled by the Utah Division of Wildlife Resources and the Utah Division of State Parks and Recreation. Indian lands make up 16 percent of the Uinta Basin.

Table 2 Land Ownership in the Uinta Basin

	Duchesne County, acres	Uintah County, acres	Uinta Basin Total, acres	Percent of Total
Bureau of Land Management	206,552	1,411,944	1,618,496	32.7
US Forest Service	453,680	269,380	723,060	14.6
National Wildlife Refuge	0	8,975	8,975	0.2
USFS and BLM Wilderness	263,882	0	263,882	5.3
National Park Service	0	50,682	50,682	1.0
Total Federal	924,115	1,740,981	2,665,096	53.9
State Parks	3,723	956	4,679	0.1
State Wildlife Lands	76,206	9,707	85,913	1.7
State Trust Lands	54,357	240,602	294,959	6.0
Total State Lands	134,287	251,264	385,551	7.8
Indian Lands	395,848	423,353	819,201	16.6
Private	614,070	461,646	1,075,716	21.8
Total	2,068,318	2,877,244	4,945,562	100.0

Source: Utah Governor's Office of Planning and Budget

Production of both crude oil and natural gas have increased in recent years in the Uinta Basin (Tables 3-4). From a low of 7.3 million barrels in 2002, crude oil production in the two counties increased to 11.4 million barrels in 2006. Production is rising faster in the Uinta Basin than in Utah as a whole. While crude oil production increased 55.5 percent in the basin from 2002 to 2006, production in the state as a whole increased by 30.2 percent. In 1997, 48.5 percent of the crude oil produced in Utah came out of the basin. By 2006, the amount of the state's crude oil production originating in the Uinta Basin had increased to 63.4 percent.

Table 3 Uinta Basin Crude Oil Production, 1997-2006

	Crude Oil, barrels			
	Duchesne County	Uintah County	Uinta Basin Total	State Total
1997	6,358,598	3,147,423	9,506,021	19,592,548
1998	6,268,634	2,940,615	9,209,249	19,223,542
1999	4,697,532	2,637,875	7,335,407	16,376,521
2000	4,772,096	2,788,908	7,561,004	15,609,030
2001	4,980,167	3,195,205	8,175,372	15,273,926
2002	4,291,457	3,016,376	7,307,833	13,770,860
2003	4,341,306	3,069,047	7,410,353	13,098,424
2004	5,838,429	3,776,762	9,615,191	14,799,208
2005	6,670,272	4,371,478	11,041,750	16,675,302
2006	6,401,299	4,959,425	11,360,724	17,926,580
Percent of State Total, 2006	35.7	27.7	63.4	100.00

Source: Utah Division of Oil, Gas and Mining

The rise in natural gas production has been even more dramatic than that of crude oil. Over the past 10 years, gas production from the basin has steadily grown from 81 BCF in 1997 to 226 BCF in 2006, a 178 percent increase (Table 4). Uintah County has been the site of most of this growth. Production in Uintah County increased by 236 percent from 1997 to 2006, and the county was responsible for 57.1 percent of the natural gas produced in Utah during 2006.

Table 4 Uinta Basin Natural Gas Production (Gross Withdrawals), 1997-2006

	Natural Gas, MCF			
	Duchesne County	Uintah County	Uinta Basin Total	State Total
1997	20,631,221	60,599,426	81,230,647	272,553,774
1998	19,204,848	70,621,273	89,826,121	297,503,246
1999	15,352,521	72,154,481	87,507,002	277,494,312
2000	13,934,444	83,100,193	97,034,637	281,170,016
2001	13,933,698	93,909,207	107,842,905	300,975,578
2002	12,476,159	104,385,705	116,861,864	293,030,004
2003	11,954,655	111,241,438	123,196,093	287,141,238
2004	14,641,315	132,454,516	147,095,831	293,735,994
2005	20,089,535	163,830,925	183,920,460	313,465,305
2006	22,525,615	203,522,421	226,048,036	356,361,028
Percent of State Total, 2006	6.32	57.11	63.43	100.0

Source: Utah Division of Oil, Gas and Mining

The rising production is reflected in increased drilling activity in Duchesne and Uintah Counties (Table 5). From a low of 150 oil and gas wells spudded in the basin during 1999, the number increased to 933 wells spudded in 2006. As with production, drilling activity in Utah is focused in the Uinta Basin During 2006, of a total of 1,056 oil and gas wells spudded in Utah, 88.3 percent were drilled in the Uinta Basin.

Table 5 Wells Spudded in the Uinta Basin, 1997-2006

	Wells Spudded			
	Duchesne County	Uintah County	Uinta Basin Total	State Total
1997	160	154	314	430
1998	123	186	309	430
1999	10	140	150	283
2000	63	289	352	540
2001	74	386	460	627
2002	44	226	270	391
2003	89	333	422	480
2004	166	441	607	659
2005	183	569	752	889
2006	279	654	933	1,057
Percent of State Total, 2006	26.4	61.9	88.3	100.00

Source: Utah Division of Oil, Gas and Mining

While production of both crude oil and natural gas is increasing in the Uinta Basin, this increase must be placed in the context of the total economy for the two counties.

The Uinta Basin had an estimated 2006 population of 43,332, up 6.1 percent from 2002 (Table 6). Major cities included Vernal, with an estimated 2006 population of 8,163, Roosevelt (4,681), Duchesne (1,506) and Naples (1,502). The 2000 Decennial Census determined that 39.3 percent of the population lives in the two urban areas of Vernal and Roosevelt. The remainder of the two counties is not densely enough populated to be considered urban.[2] Although they contained almost 40 percent of the population of the two counties, the two urban areas account for only 0.18 percent of the land area in the Uinta Basin.

Table 6 Uinta Basin Population, 2002-2006

	Population			
	Duchesne County	Uintah County	Uinta Basin Total	State Total
2002	14,856	25,984	40,840	2,358,330
2003	14,698	26,019	40,717	2,413,618
2004	14,933	26,224	41,157	2,469,230
2005	15,237	26,883	42,120	2,547,389
2006	15,585	27,747	43,332	2,615,129

Source: Utah Population Estimates Committee

[2]The Bureau of the Census defines urban areas as census blocks that have a population density of at least 1,000 persons per square mile and surrounding census blocks with a population density of 500 persons per square mile. Adjacent census blocks with a lower population density are also included if they meet additional criteria established by the Bureau of the Census.

The Uinta Basin is benefitting economically from the oil and gas boom; its unemployment rate has consistently been lower than the state average since August 2005. As energy prices have increased, employment in the Uinta Basin has risen, from approximately 14,500 persons in 1997 to over 25,000 persons in mid-2007 (Figure 6). The unemployment rate in the area has declined since the middle of 2002 after reaching a high of 10.1 percent in February 1999.

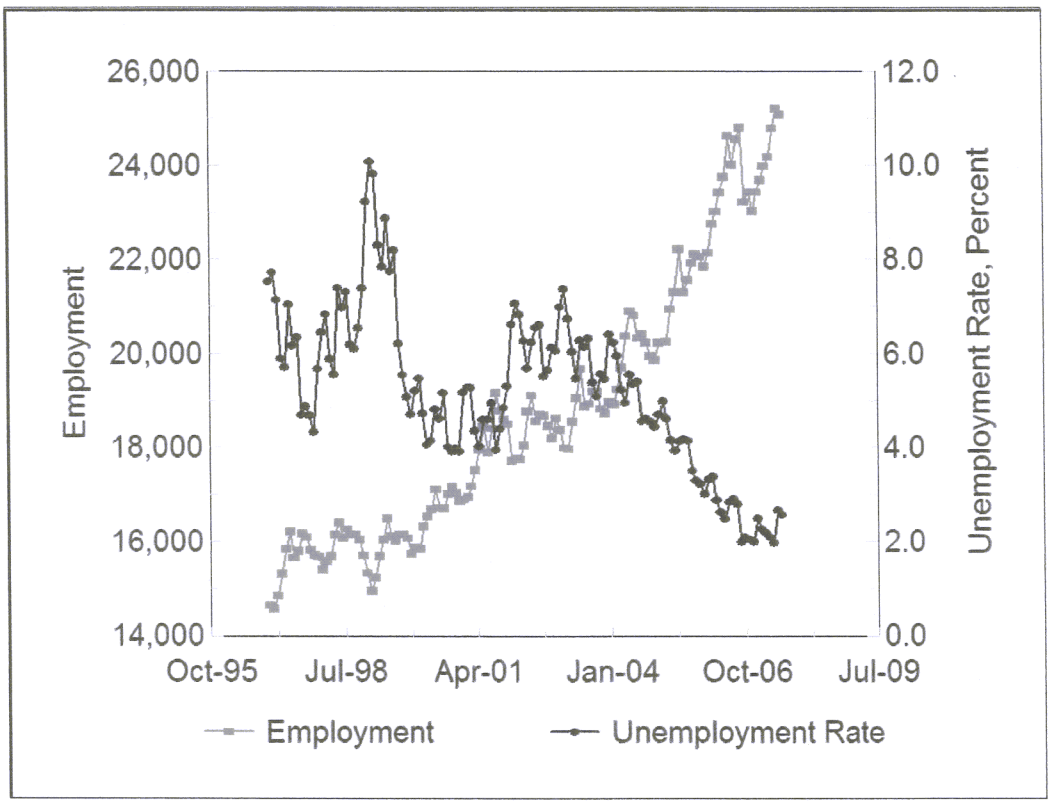


Figure 6 **Employment and the Unemployment Rate in the Uinta Basin**
Source: BLS, Local Area Unemployment Statistics

The industrial structure of the basin is significantly different from that of the state of Utah (Table 7). Mining, which includes oil and gas production, is responsible for over 20 percent of the employment in the Uinta Basin, compared with 0.9 percent of employment in Utah. The Uinta Basin is nearly 25 times more dependent on the mining industry for employment than is Utah as a whole, as indicated by a location quotient of 24.9[3]. While the majority of mining employment in the basin is due to oil and gas production, there are other mining operations present. Significant mining operations in the Uinta Basin other than oil and gas extraction are the SF

[3]Location Quotients are the ratio of an industry's share of employment in a study are, in this case the Uinta Basin, to its share in a reference area, e.g., the state of Utah.

Phosphates Ltd. mine north of Vernal and three gilsonite operations by American Gilsonite, Lexco, Inc., and Ziegler Mineral and Chemical. These other mining operations in the Uinta Basin employ an estimated 270 persons.

Other differences in industrial structure include a much lower reliance on Manufacturing and Educational Services for employment and a higher percentage of employment in Utilities, Transportation, Agriculture, Forestry, Fishing and Hunting, Real Estate and Government. The fairly high location quotient for Utilities, 2.60, is largely due to the presence of the Deseret Power Bonanza Power Plant south of Vernal. Transportation and Warehousing also has a high location quotient of 1.71. Much of the crude oil produced in the Uinta Basin contains a wax that solidifies below 105 F. This results in difficulties in shipping the crude oil to refineries via pipeline so the oil must be sent by tank truck. Government is commonly a significant employer in areas with large amounts of public land due to the presence of federal land-managing agencies.

Industries with low location quotients in the Uinta Basin include Manufacturing and Educational Services. Manufacturing has a location quotient of 0.18, indicating that the basin is only 18 percent as dependent on Manufacturing for employment as is the state of Utah. Similarly, the location quotient for Educational Services is 0.13, suggesting that there are few private educational facilities in the Uinta Basin.

Several major industries have employment data that is nondisclosable for Duchesne or Uintah Counties. This is done to protect individual company data. These industries are Management of Companies and Enterprises (NAICS 55), Administrative and Support Services (NAICS 56), Arts, Entertainment and Recreation (NAICS 71), and Accommodation and Food Services (NAICS 72). Since employment numbers are not available for these industries, location quotients can not be calculated. Data for these industries are included in the total employment figures.

Table 7 Employment by Industry in the Uinta Basin, 2006

	Duchesne County	Uintah County	Uinta Basin	Distribution, Percent	Location Quotient
Private Employment					
Agriculture, Forestry, Fishing and Hunting (NAICS 11)	37	77	114	0.6	1.51
Mining (NAICS 21)	981	3,248	4,229	21.3	24.92
Utilities (NAICS 22)	44	134	178	0.9	2.60
Construction (NAICS 23)	645	834	1,479	7.5	0.92
Manufacturing (NAICS 31-32)	151	224	375	1.9	0.18
Wholesale Trade (NAICS 42)	129	532	661	3.3	0.87
Retail Trade (NAICS 44-45)	752	1,471	2,223	11.2	0.93
Transportation and Warehousing (NAICS 48-49)	522	718	1,240	6.2	1.71
Information (NAICS 51)	172	143	315	1.6	0.59
Finance and Insurance (NAICS 52)	119	180	299	1.5	0.33
Real Estate (NAICS 53)	51	352	403	2.0	1.35
Professional, Scientific and Technical Services (NAICS 54)	79	339	418	2.1	0.40
Management of Companies and Enterprises (NAICS 55)	ND	ND	ND	ND	ND
Administrative and Support (NAICS 56)	ND	ND	ND	ND	ND
Educational Services (NAICS 61)	20	22	42	0.2	0.13
Health Care (NAICS 62)	446	831	1,277	6.4	0.74
Arts, Entertainment and Recreation (NAICS 71)	ND	59	ND	ND	ND
Accommodation and Food Services (NAICS 72)	ND	883	ND	ND	ND
Other Services (NAICS 81)	157	344	501	2.5	1.01
Government Employment	1,716	2,577	4,293	21.6	1.32
Total Employment	6,560	13,292	19,852	100.0	1.00

ND: Not disclosed to protect individual company information. Data are included in the totals.
Source: BLS, Quarterly Census of Employment and Wages

Direct employment in the oil and gas E&P industry has been rising in recent years as increased production was stimulated by higher energy prices (Table 8). The employment for oil and gas extraction is not disclosed for Duchesne County to protect individual company data. However, employment for this industry is estimated at 452 individuals for 2006[4]. Estimated employment by the oil and gas E&P industry is therefore estimated at 974 persons in Duchesne County and was 2,985 persons in Uintah County during 2006. The direct employment of 3,959 persons in the oil and gas E&P industry accounts for 19.9 percent of the total 2006 employment of 19,852 persons in the Uinta Basin.

Table 8 Oil and Gas E&P Employment in the Uinta Basin, 2001-2006

	NAICS 211 Oil and Gas Extraction	NAICS 213111 Drilling Oil and Gas Wells	NAICS 213112 Support Activities for Oil and Gas Operations	Total Oil and Gas Direct Employment
Duchesne County				
2001	ND	138	223	GT 361
2002	ND	140	203	GT 343
2003	ND	57	205	GT 262
2004	ND	58	237	GT 295
2005	ND	68	307	GT 375
2006	ND	102	420	GT 522
Uintah County				
2001	68	368	940	1,376
2002	76	278	973	1,327
2003	181	441	943	1,564
2004	186	508	1,136	1,830
2005	206	587	1,461	2,254
2006	278	913	1,794	2,985

GT: Greater Than
ND: Not disclosable to protect individual company data.
Source: BLS, Quarterly Census of Employment and Wages

Total Uintah County employment in the three NAICS industries involved in oil and gas production increased by 117 percent from 2001 to 2006. Total employment for Duchesne County over time is difficult to discern due to employment for Oil and Gas Extraction (NAICS 211) not being nondisclosed. Duchesne County employment in

[4]For 2006, the BLS lists total Mining (NAICS 21) employment as 981. Of the three subcategories at the three-digit NAICS level, employment is nondisclosable for Oil and Gas Extraction (NAICS 211) and Mining, Other than Oil and Gas (NAICS 212). Employment for Support Activities for Mining (NAICS 213) is reported as 522. The Utah Department of Workforce Services reports only one firm, with an employment between 5 and 9 persons, in NAICS 212 operating in Duchesne County. By subtraction, employment for Oil and Gas Extraction is between 450 and 454 with an expected value of 452.

well drilling (NAICS 213111) and service companies (NAICS 213112) increased by 46 percent from 2001 to 2006. Well-drilling employment actually declined over the period, though it increased from 2003 to 2006. Well drilling employment can decrease in the Uinta Basin while actual drilling activity increases due to companies located outside of Utah drilling wells in the basin.

The large percentage rise in the number of operating company employees in Uintah County indicates increased industry focus on the Uinta Basin. From 2001 to 2006, the number of persons working for operating companies (NAICS 211) in Uintah County increased by 309 percent. Over the same time frame, the number of establishments in the industry in Uintah County increased from 7 to 12. This is the number of companies reporting employment in the county and does not correspond to the number of companies operating wells in the area. Since much of the work in operating the wells is contracted out to different companies, there are many companies that have wells in the Uinta Basin that do not have full-time employees in the area. Therefore, although only 12 operating companies reported employment in the area during 2006, 54 companies reported production to the Utah Division of Oil, Gas and Mining.

The lack of vertical integration in the E&P industry is demonstrated by the distribution of employment through the three industries involved in oil and gas production. Most of the direct employment in oil and gas production is actually in the oil services industry (NAICS 213112). This industry accounted for 56 percent of E&P employment in the Uinta Basin in 2006. The drilling companies (NAICS 213111) employed 26 percent of the persons working in E&P in the basin during 2006. The operating companies that own the wells and production were responsible for only 18 percent of oil and gas production employment in the Uinta Basin in 2006.

In addition to accounting for a large portion of employment in the Uinta Basin, mining also offers some of the highest paying jobs in the area (Table 9). In both Duchesne and Uintah Counties, Mining jobs pay approximately $63,000 per year on average. In the two counties, only Utilities in Uintah County pays a higher annual wage. The average Utility position in Uintah County paid $82,676 in 2006. This is a result of the Deseret Power Bonanza Power Plant located south of Vernal. For comparison, the average Utility job in Duchesne County paid $31,471 in 2006.

Mining jobs in the two counties pay significantly higher than the average wage in the area. In Duchesne County, the average mining job paid $63,057 during 2006, 83 percent greater than the average annual wage in the county of $34,538. Similarly, in Uintah County, the average person working in the mining industry earned $63,963 during 2006, 64 percent higher than the average wage in the county of $39,056.

The lowest paying private industries in the two counties are Agriculture, Forestry, Fishing and Hunting, Educational Services, Arts, Entertainment and Recreation and Accommodation and Food Services. Each of these industries pays an average wage of less than $20,000 annually in the Uintah Basin.

Table 9 Average Annual Wages by Industry in the Uinta Basin, 2006

	Duchesne County	Uintah County
Private Employment		
Agriculture, Forestry, Fishing and Hunting (NAICS 11)	$18,232	$17,530
Mining (NAICS 21)	63,057	63,963
Utilities (NAICS 22)	31,471	82,676
Construction (NAICS 23)	34,223	32,423
Manufacturing (NAICS 31-32)	33,950	25,420
Wholesale Trade (NAICS 42)	43,791	45,875
Retail Trade (NAICS 44-45)	19,062	21,257
Transportation and Warehousing (NAICS 48-49)	51,961	55,044
Information (NAICS 51)	33,893	25,369
Finance and Insurance (NAICS 52)	26,983	32,425
Real Estate (NAICS 53)	19,385	56,548
Professional, Scientific and Technical Services (NAICS 54)	37,440	36,420
Management of Companies and Enterprises (NAICS 55)	ND	ND
Administrative and Support (NAICS 56)	ND	ND
Educational Services (NAICS 61)	3,604	17,603
Health Care (NAICS 62)	31,236	23,552
Arts, Entertainment and Recreation (NAICS 71)	ND	7,411
Accommodation and Food Services (NAICS 72)	ND	10,044
Other Services (NAICS 81)	26,803	27,602
Government Employment	28,618	31,983
All Employment	34,538	39,056

ND: Not disclosed to protect individual company information.
Source: BLS, Quarterly Census of Employment and Wages

Wages in the E&P industry in the Uinta Basin are higher than the average wage and in line with mining wages in general. Of the three NAICS industries related to E&P, the highest wages are paid by the operating companies (Table 10). The average wage paid by companies in the Oil and Gas Extraction industry (NAICS 211) was $84,795 in Uintah County during 2006. The data for Duchesne County is not disclosed, but the average wage should be similar to that paid in Uintah County. The oil service companies (NAICS 213112) pay the lowest wages of the three NAICS industries related to E&P activities. However, they are still noticeably above the average wage for the area.

Wages for the three NAICS industries involved in oil and gas E&P have been rising in recent years, reflecting increased demand for labor in the area related to rising production. Since a low in 2002 the average wage paid by the oil service companies

increased by 44 percent in Uintah County and by 25 percent in Duchesne County. Similarly, the average wage paid by drilling companies rose by 54 percent in Uintah County and by 9 percent in Duchesne County. Wages paid by the operating companies are also increasing, with a 59 percent rise from 2002 to 2006 in Uintah County.

Table 10 Oil and Gas E&P Average Annual Wages in the Uinta Basin, 2001-2006

	NAICS 211 Oil and Gas Extraction	NAICS 213111 Drilling Oil and Gas Wells	NAICS 213112 Support Activities for Oil and Gas Operations
Duchesne County			
2001	ND	$61,423	$44,412
2002	ND	54,949	42,709
2003	ND	49,464	43,903
2004	ND	51,245	43,270
2005	ND	62,037	48,194
2006	ND	59,726	53,585
Uintah County			
2001	$98,933	$46,287	$44,948
2002	53,149	45,776	40,318
2003	61,838	48,404	44,230
2004	66,627	55,208	47,845
2005	75,598	65,041	49,770
2006	84,795	70,704	58,129

ND: Not disclosed to protect individual company data.
Source: BLS, Quarterly Census of Employment and Wages

4 Economic Impacts

While rising energy prices are translating into rising employment and wages in the producing areas, not all of the economic gains are occurring in the oil and gas industry. The total increase in local economic conditions due to oil and gas activity is greater than the direct gain in the industry. This is the "multiplier effect" often referred to in economics and is a result of local spending by the industry for goods and services and spending of wages by the industry's employees. These additional economic benefits are known as the indirect and induced benefits.

In this study, economic impact is defined as the effect on employment and wages in the subject areas. Additional information on economic impact is available in Section 6 and in several listed references.

4.1 Uinta Basin

The Uinta Basin is the center of the oil and gas E&P industry in Utah. As such, the oil and gas industry is a major factor in the area's economy and is responsible for

a major portion of employment in the two counties. Direct employment in the E&P industry accounted for nearly 20 percent of total employment and 35 percent of total wages paid during 2006 (Table 11)[5]. Uintah County is more dependent upon the oil and gas industry for employment than is Duchesne County. Many of the company offices are located in Vernal but they do business in both counties.

Table 11 Direct Employment and Wages in the E&P Industry in the Uinta Basin, 2006

	Duchesne County		Uintah County		Uinta Basin Total	
	Employment	Wages, 1,000	Employment	Wages, 1,000	Employment	Wages, 1,000
Total	6,560	$226,561	13,292	$519,112	19,852	$745,683
E&P Industry, Direct	974	66,904	2,985	192,338	3,959	259,242
E&P Industry, percent of total	14.8	29.5	22.5	37.0	19.9	34.8

Source: BLS, Quarterly Census of Employment and Wages; author's estimates.

In addition to the direct employment, additional jobs and wages due to spending by the industry and employees results in significant economic benefits to the Uinta Basin. Other employment due to spending by the E&P industry is not limited to the mining industry but is distributed throughout different industries. Total employment in the Uinta Basin due to the E&P industry, including direct, indirect, and induced, was estimated at 49.5 percent of total jobs in the area in 2006 (Table 12). When examining employment by industry, the oil and gas industry is shown to have significant effects on in several other industries.

The E&P industry is responsible for large portions of employment in Retail Trade, Transportation and Warehousing, Real Estate and Other Services. The RIMS II Input-Output model used to determine economic impacts calculates employment by industry irrespective of type of ownership, i.e., private or government employment. However, the BLS figures do segregate private and government employment. The employment due to the oil and gas industry given in Table 12 includes some government employment in the various industries, not just the private employment. Two of the listed industries have significant government employment in addition to the private employment shown Table 12. They are Educational Services and Health Care and Social Assistance. The RIMS II model classifies employees in public education under Educational Services, so the total number of persons employed in this industry is much greater than the 42 persons in private employment listed in Table 12. Other industries with significant levels of public employment are Health Care and Social Assistance and, to a lesser extent, Utilities and Arts, Entertainment and Recreation.

[5]Total wages for Oil and Gas Extraction (NAICS 211) were not released by the BLS for Duchesne County. Total wages were estimated by multiplying the estimated employment of 452 (see Footnote 4) by the average wage for the industry in Uintah County of $84,795.

Several industries have no government employment in the Uinta Basin. These industries are Agriculture, Forestry, Fishing and Hunting, Mining, Manufacturing, Wholesale Trade, Professional, Scientific and Technical Services, Management of Companies and Enterprises, and Accommodation and Food Services. Although there are government employees located in the Uinta Basin to regulate the oil and gas industry, these are not considered part of the Mining industry. The state Division of Oil, Gas and Mining has four employees in the area and there are also several dozen BLM employees dedicated to regulating the industry. For purposes of employment classification, these employees are considered to be employed in NAICS-92 Public Administration, which is included in the government employment in Table 12.

Table 12 Employment Due to Oil and Gas E&P in the Uinta Basin, 2006

	Uinta Basin Total Employment	Total Employment Due to Oil and Gas E&P	Oil and Gas E&P Employment, percent of total
Private Employment			
Agriculture, Forestry, Fishing and Hunting (NAICS 11)	114	14	12.2
Mining (NAICS 21)	4,229	4,020	95.1
Utilities (NAICS 22)	178	33	18.6
Construction (NAICS 23)	1,479	598	40.4
Manufacturing (NAICS 31-32)	375	185	49.3
Wholesale Trade (NAICS 42)	661	145	22.0
Retail Trade (NAICS 44-45)	2,223	1,558	70.1
Transportation and Warehousing (NAICS 48-49)	1,240	875	70.6
Information (NAICS 51)	315	59	18.8
Finance and Insurance (NAICS 52)	299	142	47.4
Real Estate (NAICS 53)	403	307	76.3
Professional, Scientific and Technical Services (NAICS 54)	418	229	54.8
Management of Companies and Enterprises (NAICS 55)	ND	16	NA
Administrative and Support (NAICS 56)	ND	80	NA
Educational Services (NAICS 61)	42	58	138.7
Health Care (NAICS 62)	1,277	626	49.0
Arts, Entertainment and Recreation (NAICS 71)	ND	49	NA
Accommodation and Food Services (NAICS 72)	ND	427	NA
Other Services (NAICS 81)	501	378	75.5
Households	NA	36	NA
Government Employment	4,293	NA	NA
All Employment	19,582	9,835	49.5

Note: There is significant government employment in both Educational Services and Health Care and Social Assistance in the Uinta Basin. The employment calculated using the RIMS II model, which includes government employment, can exceed the private employment in these industries.
ND: Nondisclosable. Data are included in the totals. NA: Not Applicable.
Source: BLS, Quarterly Census of Employment and Wages; author's calculations.

Oil and gas E&P accounts for over 60 percent of all wages paid in the Uinta Basin (Table 13). The industry is responsible for a higher percentage of wages than employment due to oil and gas E&P paying above average wages. In addition to

Mining, industries with a significant portion of wages due to oil and gas extraction include Manufacturing, Retail Trade, Finance and Insurance, Professional, Scientific and Technical Services, and Other Services. As with employment, the amount of wages reported in Educational Services is greater than the wages paid by private employers in that industry. This is due to public schools accounting for a major portion of the employment in the Educational Services. Public schools are not private employment, but government employment, and so their wages are categorized separately in the BLS figures.

Table 13 Wages Due to Oil and Gas E&P in the Uinta Basin, 2006

	Uinta Basin Total Wages, $1,000	Total Wages Due to Oil and Gas E&P, $1,000	Oil and Gas E&P Wages, percent of total
Private Employment			
Agriculture, Forestry, Fishing and Hunting (NAICS 11)	2,027	243	12.0
Mining (NAICS 21)	269,605	263,111	97.6
Utilities (NAICS 22)	12,473	2,959	23.7
Construction (NAICS 23)	49,123	24,547	50.0
Manufacturing (NAICS 31-32)	10,808	7,897	73.1
Wholesale Trade (NAICS 42)	30,033	6,886	22.9
Retail Trade (NAICS 44-45)	45,603	35,053	76.9
Transportation and Warehousing (NAICS 48-49)	66,650	34,377	51.6
Information (NAICS 51)	9,457	3,257	34.4
Finance and Insurance (NAICS 52)	9,058	5,683	62.7
Real Estate (NAICS 53)	20,894	11,872	56.8
Professional, Scientific and Technical Services (NAICS 54)	15,049	11,553	76.8
Management of Companies and Enterprises (NAICS 55)	ND	852	NA
Administrative and Support (NAICS 56)	ND	1,836	NA
Educational Services (NAICS 61)	466	1,195	256.5
Health Care (NAICS 62)	33,508	19,975	59.6
Arts, Entertainment and Recreation (NAICS 71)	ND	892	NA
Accommodation and Food Services (NAICS 72)	ND	5,830	NA
Other Services (NAICS 81)	13,690	9,651	70.5
Households	NA	578	NA
Government Employment	131,529	NA	NA
All Employment	745,683	448,246	60.1

Note: There is significant government employment in both Educational Services and Health Care and Social Assistance in the Uinta Basin. The wages calculated using the RIMS II model, which includes government wages, can exceed the private wages in these industries.
ND: Not disclosed, NA: Not Applicable.
Source: BLS, Quarterly Census of Employment and Wages; author's calculations.

5 Fiscal Impacts

The oil and gas industry also has fiscal impacts on the local areas. Fiscal impacts refer to impacts on government finances and tax collections. The oil and gas industry is subject to the tax laws common to all business. There are also impacts unique to the industry. Production on federal land is subject to a royalty payment

under the Mineral Lands Leasing Act of 1920. This royalty is paid to the Minerals Management Service, an agency within the U.S. Department of Interior. A portion of the federal mineral royalties is returned to the state of origin. Generally, one-half of federal mineral royalties are returned to the states of origin. Royalties from production on Indian lands are returned to the appropriate tribe, not to the state government. Since a large portion of the crude oil production in Utah occurs on Indian lands, especially in Duchesne and San Juan Counties, the amount of crude oil royalty returned to the state government is significantly less than one-half of the amount paid to the Minerals Management Service. The states have full discretion as to the distribution of federal mineral royalties as long as priority is given to areas with economic and/or social impacts from leasing activities. The Minerals Management Service does not release federal mineral royalty data at the county level, but statewide data are available.

Federal mineral royalties due to oil and gas production in Utah have dramatically increased in recent years, to $299 million in 2006, a 228 percent rise from $91 million in 2001 (Table 14). Oil and gas production accounted for 91.3 percent of the royalties paid for mineral production on federal land in Utah during 2006. There was also an additional $103 million paid in bonus and rents on federal mineral leases. These are fees associated with awarding federal mineral leases and maintaining the leases until production is initiated. Table 14 includes royalties due to oil and gas production, but does not include bonus or rent payments for federal oil and gas leases. Of the nearly $300 million paid in federal mineral royalties by the oil and gas industry in Utah, $109 million was returned to the state government.

Table 14 Federal Mineral Royalty Payments and Disbursements for Utah, 2001-2006

	Oil		Natural Gas		Total	
	Royalties	Disbursements	Royalties	Disbursements	Royalties	Disbursements
2001	$32,799,794	$4,392,667	$58,553,527	$26,210,621	$91,353,321	$30,603,288
2002	26,028,911	3,493,794	37,653,050	11,921,373	63,681,961	15,415,167
2003	37,462,357	5,575,810	55,369,036	26,040,706	92,831,293	31,616,515
2004	45,743,590	7,235,629	87,075,857	38,228,494	132,819,447	45,464,122
2005	66,900,212	10,405,687	118,132,687	53,647,636	185,032,900	64,053,323
2006	106,457,298	21,866,066	193,416,183	87,551,457	299,873,481	109,417,522

Note: Years are federal fiscal years. Natural gas includes natural gas liquids from gas processing plants.
Source: Minerals Management Service

In Utah, federal mineral royalties are distributed to several different accounts according to state law (Table 15). The largest recipients of federal mineral royalties in Utah are the Permanent Community Impact Fund and the Department of Transportation. The funds distributed to the Department of Transportation are then distributed to local governments to fund local highways in proportion to the amount of mineral lease money generated by each county. The Permanent Community

Impact Fund makes loans and grants to state agencies and subdivisions of state government impacted by mineral resource development. Unlike the funds administered by the Department of Transportation, which are distributed in proportion to royalties generated in the county, the Permanent Community Impact Fund is distributed by a state-appointed board in response to proposals submitted by local governments. Therefore, the distribution of funds by the Permanent Community Impact Fund to the various counties may vary from the amount of royalty generated. The payments in lieu of taxes cited in Table 15 are not the payments in lieu of taxes made by the federal government for federal land in Utah but are payments made by the state government to counties for lands controlled by the School and Institutional Trust Lands Administration, state Division of Parks and Recreation and the state Division of Wildlife Resources.

Table 15 Distribution of Federal Mineral Royalties in Utah

	Percent
Permanent Community Impact Fund	32.50
State Board of Education	2.25
Utah Geological Survey	2.25
Water Research Laboratory	2.25
Department of Transportation	40.00
Department of Community and Culture	5.00
Payments in Lieu of Taxes	52 cents per acre
Permanent Community Impact Fund	Remainder

Note: The amount paid for Payments in Lieu of Taxes has been adjusted annually since 1994 according to the Consumer Price Index.
Source: Utah State Code, Title 59, Chapter 21.

The School and Institutional Trust Lands Administration (SITLA) controls mineral rights on approximately 4.4 million acres in Utah. These lands area held trust for the public schools in Utah and 11 other beneficiaries and were established at statehood and through land exchanges with the federal government. During 2006, royalties paid for oil and gas extraction on SITLA lands were $82.7 million. This was 51.0 percent of total SITLA revenue for 2006. These funds are not returned to the county of origin, but are placed in a permanent fund managed by the state treasurer on behalf of the public schools as a beneficiary or distributed to the appropriate beneficiary as mandated. Dividends and interest from the Public School Fund are distributed annually to all Utah public schools based on an established formula.

In addition to royalties, there is an oil and gas severance tax in Utah and a oil and gas conservation fee which are levied on all production in the state. The Oil and Gas Severance Tax in placed in the state general fund and the tax rate varies from 3 to 5 percent of the sales price. The Oil and Gas Conservation Fee funds the state Division of Oil, Gas and Mining. The fee is imposed at a rate of 0.2 percent of the value of production.

Both the Oil and Gas Severance Tax and the Oil and Gas Conservation Fee have significantly increased in recent years (Table 16). The Oil and Gas Severance Tax increased by 82 percent from 2001 to 2006 while the Oil and Gas Conservation Fee increased by 102 percent. The drop from 2001 to 2002 was due to the wellhead price of natural gas produced in Utah dropping from $3.52 per MCF in 2001 to $1.99 per MCF in 2002. These data reflect statewide oil and gas operations and are not specific to the Uinta Basin.

Table 16 State Tax Collections Related to Oil and Gas Production, 2001-2006

	Oil and Gas Severance Tax	Oil and Gas Conservation Fee
2001	$39,357,798	$2,748,318
2002	18,893,082	1,710,219
2003	26,745,279	1,943,755
2004	36,659,808	2,696,250
2005	53,484,320	3,631,963
2006	71,513,869	5,560,449

Note: Years are state fiscal years.
Source: Utah State Tax Commission

5.1 Uinta Basin

The largest direct fiscal impacts on the Uinta Basin due to oil and gas operations in the area are property taxes paid by the operating companies and federal mineral royalties distributed to the local governments by the Utah Department of Transportation. The Utah State Tax Commission centrally assesses oil and gas properties using a net present value approach applied to future production. The local county treasurers bill and collect the taxes. Property taxes are levied by numerous units of local government, including county and city governments, school districts, and special service districts.

Property taxes paid on oil and gas properties are a significant portion of total property taxes in the Uinta Basin (Table 16). During 2006, the oil and gas industry paid nearly 40 percent of total property taxes in the two Uinta Basin counties. Table 16 refers to all property taxes paid to various government entities in the two counties, not just the county governments. As prices of crude oil and natural gas have increased in recent years, the net present value of future production has increased. This, coupled with rising production, has resulted in the amount of property taxes paid by the oil and gas industry in the Uinta Basin increasing by nearly four times over the past 10 years, not adjusting for inflation. Oil and gas property taxes have been rising faster in Uintah County than in Duchesne County, reflecting rising natural gas production in the county. Property taxes paid on oil and gas production increased by 440 percent in Uintah County from 1997 to 2006, and by 122 percent in Duchesne County. Given the rising production and expected

continuation of current energy prices, the property taxes paid by the oil and gas production industry in the Uinta Basin should continue to rise into the future.

Table 17 Oil and Gas Property Tax Payments in the Uinta Basin, 1997-2006

	Duchesne County		Uintah County		Uinta Basin Total	
	Oil & Gas Property Tax	Percent of Total Property Tax	Oil & Gas Property Tax	Percent of Total Property Tax	Oil & Gas Property Tax	Percent of Total Property Tax
1997	$2,412,970	27.2	$2,389,667	15.7	$4,802,637	20.0
1998	2,353,888	27.9	2,858,447	18.1	5,212,335	21.5
1999	1,561,466	21.3	2,309,639	15.6	3,871,105	17.5
2000	1,749,689	19.7	2,579,728	16.9	4,329,417	17.9
2001	2,221,385	23.1	3,449,316	20.8	5,670,701	21.7
2002	1,773,249	18.4	4,054,227	22.5	5,827,476	21.1
2003	1,739,101	17.2	4,276,125	21.9	6,015,226	20.3
2004	2,407,040	21.8	5,985,003	25.3	8,392,043	24.2
2005	3,640,044	27.8	8,241,224	33.0	11,881,268	31.2
2006	5,358,661	33.9	12,895,362	41.1	18,254,024	38.7

Source: Utah State Tax Commission, Property Tax Division Annual Reports

The funds generated through federal mineral royalties that are returned to the Uinta Basin through the Utah Department of Transportation are also a significant source of revenue for the local governments. These funds actually exceed the amount of property tax paid by the oil and gas industry. During 2006, Duchesne and Uintah Counties collectively received $30 million dollars in federal mineral royalties returned to them by the Department of Transportation. This was a 296 percent increase over the amount returned in 2001.

Table 18 Federal Mineral Royalties Returned by UDOT to the Uinta Basin, 2001-2006

	Duchesne County	Uintah County	Uinta Basin Total
2001	$789,854	$6,856,410	$7,646,264
2002	718,112	3,031,081	3,749,193
2003	678,705	6,893,486	7,572,192
2004	931,428	11,767,611	12,699,038
2005	1,903,292	16,704,532	18,607,824
2006	2,750,055	27,500,128	30,250,182

Note: Years are state fiscal years.
Source: Utah Department of Transportation

Table 18 includes data on all royalties from federal mineral leases in Utah, not just oil and gas operations. Although there are some other federal mineral leases in the Uinta Basin, notably gilsonite, by far the majority of royalties are due to oil and gas production.

Royalties paid to SITLA due to production of oil and gas in the Uinta Basin rose significantly from 2005 to 2006 (Table 18). In 2005, oil and gas production in the Uinta Basin resulted in $23 million in SITLA royalties. Rising production and prices resulted in a 54 percent increase in 2006, with over $34 million in SITLA royalties paid.

Table 19 Royalties Paid for Production on SITLA Lands in the Uinta Basin, 2005-2006

	Duchesne County	Uintah County	Uinta Basin Total
2005	$2,976,668	$19,990,367	$22,967,035
2006	2,686,706	32,720,101	35,407,575

Note: Years are state fiscal years.
Source: School and Institutional Trust Lands Administration

State personal income taxes as a result of oil and gas E&P activities in the Uinta Basin is estimated at just over $18 million for 2006 (Table 20).

Table 20 Personal State Income Taxes due to Oil and Gas E&P in the Uinta Basin

	Uinta Basin Total
Total Wages due to Oil and Gas E&P, $1,000	$448,246
Personal State Income Taxes, $1,000	18,026

Source: Author's Calculations. Details of the estimation are in Section 6.

6 Technical Notes and Methodology

Industries are classified by economists according to the North American Industry Classification System (NAICS), which was developed by the Office of Management and Budget in cooperation with other federal agencies and foreign governments (Office of Management and Budget, 2002). The NAICS codes replaced the Standard Industrial Classification (SIC) Codes that had been used since the 1930s. This change was prompted by structural changes in the U.S. economy, with the services sector becoming a much larger portion of the economy and more complex than when the SIC codes were developed. In the switch, the 10 major industrial sectors under the SIC codes were replaced with 20 major sectors under the NAICS Codes. Many of the industrial sectors under the SIC codes were split among two or more of the redefined sectors under the NAICS codes, making comparisons difficult. The NAICS codes better explain the structure of the current economy but make time series data difficult to compile.

Under the NAICS system, companies are classified under 20 major industrial categories and the categories are further subdivided as needed. There are three classifications directed related to the oil and gas exploration and production industry.

These are NAICS 211 – Oil and Gas Extraction, NAICS 213111 – Drilling Oil and Gas Wells, and NAICS 213112 – Support Activities for Oil and Gas Operations. These three classifications cover the operating companies, drilling companies, and service companies, respectively. For this study, we are considering them collectively as the oil and gas E&P industry.

Other local businesses and industries benefit from E&P activities. Examples of these are seismic companies, regulatory and environmental consulting firms, consulting geologists, trenching and dirtwork, and utilities providing electricity. Other benefits accrue to local hotels and restaurants as a result of spending by visiting workers. These types of effects are referred to as the indirect and induced impacts. The indirect and induced impacts can be calculated from the value of transactions between the E&P industry and these other businesses using input-output economic models.

6.1 NAICS Codes Related to Oil and Natural Gas Production

For this study, we are considering the following three NAICS classifications collectively as the oil and gas E&P industry. The definitions listed are those developed by the Office of Management and Budget.

NAICS 211 – Oil and Gas Extraction Industries in the Oil and Gas Extraction subsector operate and/or develop oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operation of separators, emulsion breakers, desilting equipment and field gathering lines for crude petroleum and natural gas; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. The subsector includes the production of crude petroleum, the mining and extraction of oil from oil shale and oil sands, and the production of natural gas, sulfur recovery from natural gas, and recovery of hydrocarbon liquids.

Establishments in this subsector include those that operate oil and gas wells on their own account and for others on a contract or fee basis. Establishments primarily engaged in providing support services, on a fee or contract basis, required for the drilling or operation of oil and gas wells (except geophysical surveying and mapping, mine site preparation, and construction of oil/gas pipelines) are classified in Subsector 213, Support Activities for Mining.

NAICS 213111 – Drilling Oil and Gas Wells This U.S. industry comprises establishments primarily engaged in drilling oil and gas wells for others on a contract or fee basis. This industry includes contractors that specialize in spudding in, drilling in, redrilling, and directional drilling.

NAICS 213112 – Support Activities for Oil and Gas Operations This U.S. industry comprises establishments primarily engaged in performing support activities on a contract or fee basis for oil and gas operations (except site preparation and related activities). Services included are exploration (except geophysical surveying and mapping); excavating slush pits and cellars; well surveying; running, cutting, and pulling casings, tubes, and rods; cementing wells, shooting wells; perforating well casings; acidizing and chemically treating wells; and cleaning out, bailing, and swabbing wells.

6.2 Economic Impact Modeling

Economic impacts on an economy arise from exogenous sources or activities that result in new funds being injected into the economy. Examples include are products that are exported and new construction funding. It is important for outside funds to be injected into a regional economy for economic impacts to occur. If an activity is financed by funds from inside a regional economy, known as residentiary spending, then the funds are diverted from one industrial sector to another and there is no net multiplier effect or economic impact. Crude oil and natural gas from the producing areas in Utah are exported to refineries and markets in other portions of the country. Exporting oil and gas results in an inflow of funds which creates a positive economic impact on the area.

In this study, economic impact is used to mean the impact of oil and gas E&P activities on the amount of employment and wages paid in the various producing regions in Utah. Many similar studies present the total economic output of an activity as the economic impact; this is the sum of all transactions in a supply chain and can be much larger than the value of the final good or service provided to the end consumer. Similarly, many authors apply economic output multipliers to all spending related to an activity, with no distinction between export-based and residentiary spending. The result is often termed "economic contribution" and presented as economic impact. As with all economic output calculations, the result is much larger than the value of the final product delivered to an end consumer.

The oil and gas exploration and production industry has a direct impact on the local economy through employment and wages paid. In addition, there are additional indirect and induced impacts. Indirect impacts result from local spending by the E&P industry and induced impacts arise from employees of the E&P industry spending their earnings.

Examples of indirect impacts are employment and wages at seismic companies, regulatory and environmental consulting firms, consulting geologists, trenching and dirtwork, and utilities providing electricity. Other benefits accrue to local hotels and restaurants as a result of spending by visiting workers. The indirect and induced

impacts can be calculated from the value of transactions between the E&P industry and these other businesses.

The RIMS II Input-Output model developed by the Bureau of Economic Analysis was used to determine the indirect and induced economic impacts of the oil and gas exploration and production industry in the Uinta Basin. The RIMS II model is based on an accounting framework called an input-output table. From each industry, an input-output table shows the industrial distribution of inputs purchased and outputs sold. The Bureau of Economic Analysis has developed a national input-output table (Bureau of Economic Analysis, 1997). To develop region-specific input-output tables, the national input-output table is modified using regional economic data. The producer portion of the input-output table is modified using location quotients at the six-digit NAICS level based on personal income data for service-producing industries and wage and salary data for nonservice-producing industries. Household data is modified to account for commuting across regional boundaries and savings and taxes. Once the national input-output table is regionalized, the multipliers are estimated through use of matrix algebra. The RIMS II model estimates the employment and wage impacts by major NAICS industry.

Data on spending by the E&P industry in the Uinta Basin was obtained via a survey of operating, drilling and service companies operating in the area. Personnel with the Bureau of Economic and Business Research at the University of Utah cooperated with the Independent Petroleum Association of the Mountain States (IPAMS) to developed survey forms with input from several representatives of the petroleum industry. IPAMS distributed the survey forms to operating, drilling and service companies operating in the Uinta Basin and the forms were returned to the Bureau of Economic and Business Research. Data from returned survey forms was totaled by spending category. Using data on total production of oil and gas, number of wells spudded and employment reported by government agencies, the total spending reported by responding companies was expanded to total industry spending in the region. The multipliers from the RIMS II model were then applied to the total spending by category to determine the indirect and induced employment and wages.

State income tax impacts were estimated by calculating the ratio of the Utah income tax liability for Duchesne and Uintah Counties to the total of the total earnings by place of work for the two counties as determined by the Bureau of Economic Analysis. This average of this ratio for the years 2003 through 2005 was 4.02 percent. This ratio was then applied to the total estimated earnings due to oil and gas E&P in the Uinta Basin of $448,246 thousand to estimate the state personal income tax.

7 References

Bureau of Economic Analysis. 2007. Local Area Personal Income. http://www.bea.gov/regional/reis/. Downloaded Nov. 6, 2007.

Bureau of Labor Statistics. 2007. Quarterly Census of Employment and Wages. http://stats.bls.gov/cew/home.htm. Downloaded Sept. 9, 2007.

Energy Information Administration. 2007. *Short-Term Energy Outlook September 2007.* http://www.eia.doe.gov/emeu/steo/pub/contents.html. Downloaded Sept. 11, 2007.

Isard, W., I.J. Azis, M.P., Drennan, R.E. Miller, S. Saltzman, and E. Throbecke. 1998. *Methods of Interregional and Regional Analysis.* Ashgate Publishing Limited. 490 pp.

Minerals Management Service. 2007. MRM Statistical Information. http://www.mrm.mms.gov/MRMWebStats/default.aspx. Downloaded Oct. 3, 2007.

Office of Management and Budget. 1997. *North American Industry Classification System.* 1247 pp.

Schaffer, W. A. 1999. *Regional Impact Models.* West Virginia University Regional Research Institute. http://www.rri.wvu.edu/WebBook/Schaffer/index.html. Accessed July 18, 2007. 80 pp.

U.S. Bureau of the Census. 2007. Subcounty Population Data Sets. http://www.census.gov/popest/cities/SUB-EST2006-states.html. Downloaded Sept. 12, 2007.

Utah Department of Transportation. 2007. Mineral Lease Distributions. http://www.dot.utah.gov/main/f?p=100:pg:11808295696151236794:::1:T,V:135,. Downloaded Oct. 4, 2007.

Utah Division of Oil, Gas and Mining. 2007. Production Reports. http://oilgas.ogm.utah.gov/Publications/Publications.htm. Downloaded Sept. 12, 2007.

Utah Geological Survey. 2006. *Utah! 100 Years of Exploration and Still the Place to Find Oil and Gas.* Public Information Series 71. nonpaginated.

Utah Governor's Office of Planning and Budget. 2000. *Federal Land Payments in Utah.* http://governor.utah.gov/dea/Publications/Report.pdf. Downloaded Sept. 11, 2007.

Utah State Tax Commission. 2007. Revenue Reports (TC-23). http://www.tax.utah.gov/esu/revenue/index.html. Downloaded Nov. 5, 2007.

Utah State Tax Commission. 2007. Utah Income and Corporate Tax Statistics. http://www.tax.utah.gov/esu/income/index.html. Downloaded Nov. 2, 2007.

ATTACHMENT D

ATTACHMENT D

The Structure and Economic Impact of Utah's Oil and Gas Exploration and Production Industry Phase II - Carbon and Emery Counties

Prepared for:

Public Land Policy Coordination Office
Utah Governor's Office
5110 State Office Building
P. O. Box 141107
Salt Lake City, Utah 84114

Prepared by:

Bureau of Economic and Business Research
University of Utah
1645 East Campus Center Drive
Salt Lake City, Utah 84112

December 2007

Table of Contents

List of Tables

List of Figures

List of Acronyms & Abbreviations

BCF	Billion Cubic Feet
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
DOGM	Utah Division of Oil, Gas and Mining
E&P	Exploration and Production
IPAMS	Independent Petroleum Association of the Mountain States
MCF	Thousand Cubic Feet
MMCF	Million Cubic Feet
MW	Megawatts
NAICS	North American Industry Classification System
NYMEX	New York Mercantile Exchange
PADD	Petroleum Administration for Defense District
SIC	Standard Industrial Code
SITLA	School and Institutional Trust Lands Administration
RIMS II	Regional Input-Output Modeling System
UDOT	Utah Department of Transportation
USFS	U.S. Forest Service
WTI	West Texas Intermediate Crude

The Structure and Economic Impact of Utah's Oil and Gas Exploration and Production Industry

1 Executive Summary

The Bureau of Economic and Business Research at the University of Utah has completed an economic impact study of the oil and gas exploration and production industry in Carbon and Emery Counties in east-central Utah. Carbon and Emery Counties are an increasingly important center of natural gas production in Utah. Rapidly rising energy prices in recent years have stimulated greater production of both crude oil and natural gas in the northern Rocky Mountains, and the study area is an integral part of the oil and gas industry in the Rocky Mountain area. The study area's natural gas production increased 316 percent from 23.7 BCF in 1997 to 98.5 BCF in 2006.

The rise in oil and gas activity is having a noticeable and positive economic impact on Carbon and Emery Counties. During 2006, the oil and gas exploration and production industry was directly responsible for an estimated 137 jobs and $6.5 million in wages in the two counties. When including indirect and induced impacts due to company and employee spending, the oil and gas industry accounted for 524 jobs and $22.2 million in wages in the area. This represents 4.0 percent of total employment and 4.9 percent of total wages in the study area.

The industry also has a sizeable fiscal impact on local governments in the two county area. Property taxes paid on producing oil and gas wells were $10.2 million in 2006 and accounted for 24.3 percent of all property taxes paid in the two counties. Federal mineral royalties distributed to the two counties by the Utah Department of Transportation during 2006 amounted to $13.7 million.

2 Background

The recent rise in the price of gasoline has refocused attention on energy markets with an intensity not seen since the collapse of oil prices in the mid 1980s. In contrast to the energy shortage of the 1970s, which was largely driven by constrained supply due to geopolitical issues, the recent runup is a result of increasing demand and decreasing supply from aging fields. Crude oil, and to a lesser extent natural gas, is a worldwide commodity with international supply and demand factors determining prices. Consumption of petroleum products is up worldwide, with developing countries driving the increase. Consumption of petroleum in China grew over 30 percent from 2002 to 2006. This rise in demand has resulted in a dramatic increase in the nominal price of crude oil (Figure 1).

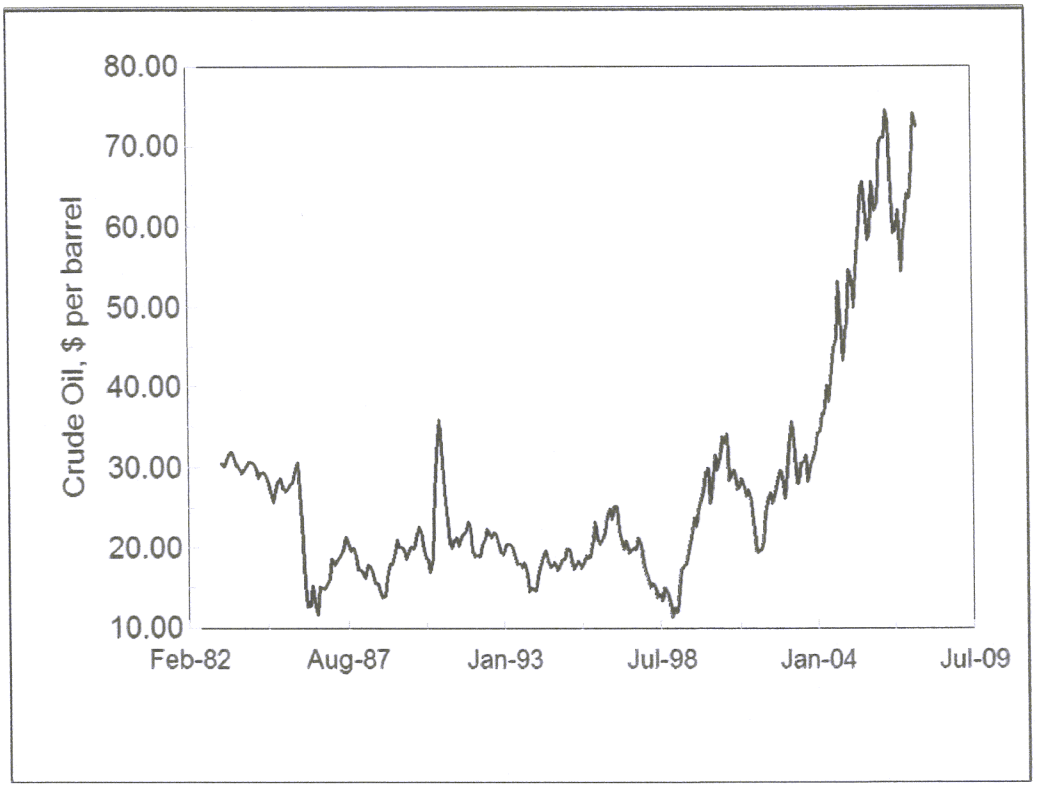


Figure 1 **Crude Oil Price: NYMEX Near Month Contract for Light Sweet Crude**
Source: Energy Information Administration

The price of crude oil was relatively flat during the 1990s, with prices in the $20 to $30 range. Then, from a low of $11.31 per barrel in December 1998, crude oil increased to over $70 per barrel in April 2006 and reached $79.63 in September 2007. Forecasts expect crude oil prices to remain near current levels in the future.

In September 2007 the Energy Information Administration forecast the price of West Texas Intermediate Crude[1] would remain over $71 per barrel through the end of 2008. During November 2007, prices were in the $90 per barrel range.

At the same time, natural gas prices have increased from historically low values around $2 per MCF in the late 1990s to a current price of about $7 per MCF, with increased volatility in recent years (Figure 2). Natural gas is more of a regional commodity than crude oil, with more dependence on local supply and demand factors. The necessity of transporting natural gas by pipeline results in availability of transportation infrastructure having a large influence on regional prices. Currently, there is a shortage of pipeline capacity in the Rocky Mountains so wellhead natural gas prices in the area are depressed compared to the rest of the country.

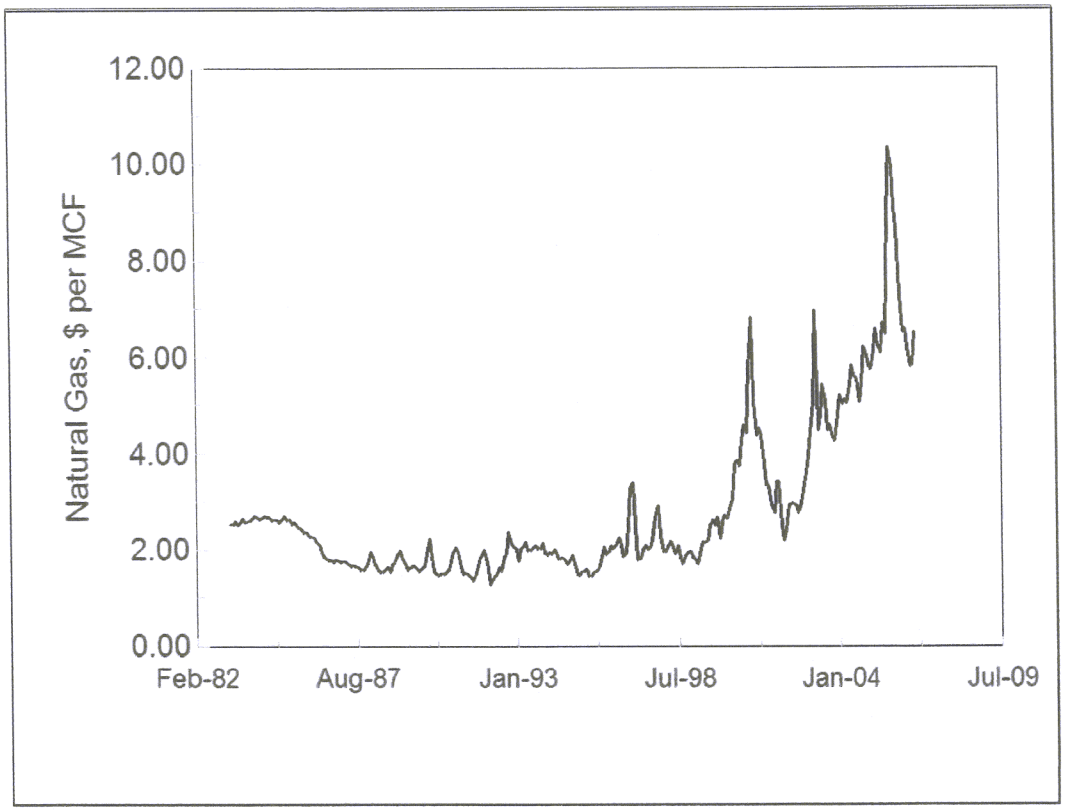


Figure 2 **Average U.S. Wellhead Price of Natural Gas**
Source: Energy Information Administration

[1]West Texas Intermediate (WTI) refers to a crude stream produced in Texas and Oklahoma that is the most common reference or "marker" for pricing crude oil and, along with several other domestic and foreign crude streams, is acceptable for settling New York Mercantile Exchange contracts for light, sweet crude oil.

While increased demand in the Pacific Rim has driven petroleum prices, demand has also increased in the U.S. In addition, domestic crude oil production has declined from a high value of 3.5 billion barrels in 1970 to 1.9 billion barrels in 2006. Even with additional drilling in response to higher prices, domestic production is dropping due to geologic constraints. The Rocky Mountain states are the only area in the country currently experiencing significant increases in production of crude oil and natural gas. Of the five Petroleum Administration for Defense Districts (PADD) (Figure 3) used for analyzing petroleum data, crude oil and natural gas production are increasing only in PADD I (the East Coast) and in PADD IV (the Rocky Mountains).

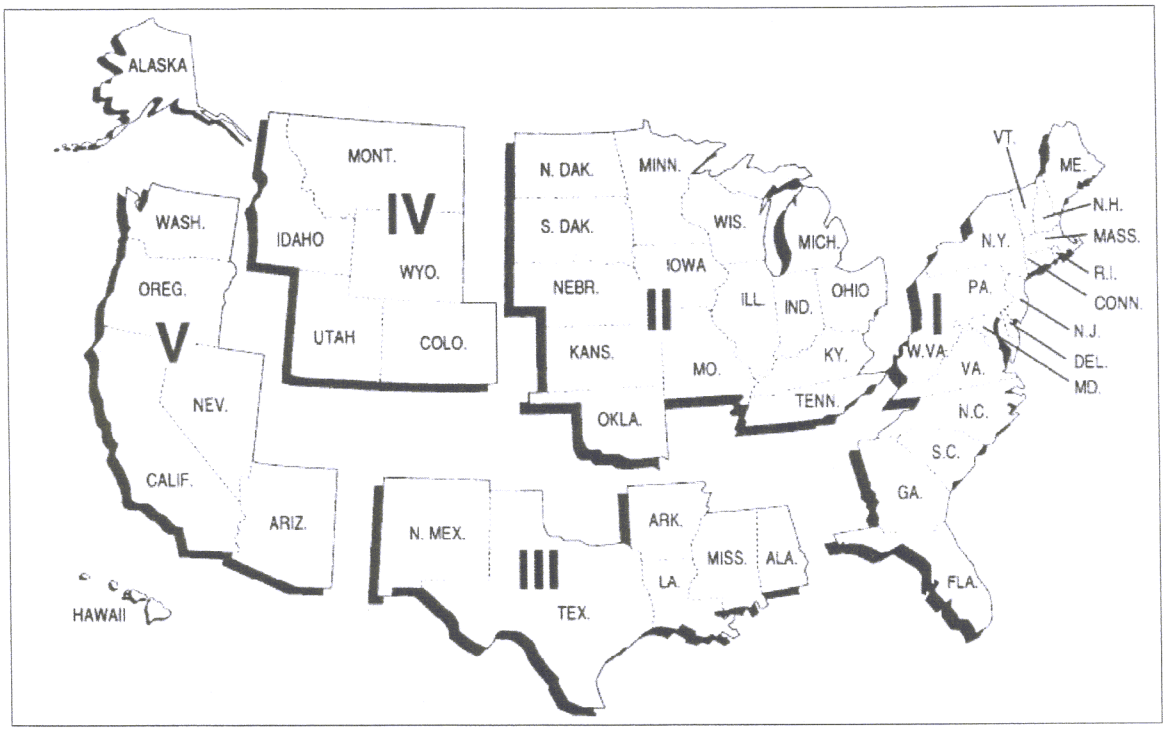


Figure 3 **Petroleum Administration for Defense Districts (PADD)**
Source: Energy Information Administration

Although crude oil production increased 11.3 percent and natural gas 15.3 percent on the East Coast from 2002 to 2005, the region is responsible for less than one-half of one percent of domestic crude oil production and three percent of natural gas production. Over the same period, the amount of crude oil produced in the Rocky Mountains increased by 20.4 percent while production on the Gulf Coast (PADD III), the largest producing area in the country, dropped by 12.8 percent. The center for production of natural gas in the United States is also shifting from the Gulf Coast to the Rocky Mountains. In 1982, PADD III was responsible for 75.5 percent of U.S. natural gas production and PADD IV supplied only 4.2 percent. By 2005, the

amount of natural gas produced in PADD III had dropped to 62.5 percent of total production while the amount from PADD IV had increased to 17.0 percent. Additionally, natural gas production in the Rocky Mountains is increasing approximately five percent annually. The increase in crude oil and natural gas production in the Rocky Mountain states is creating an economic boom in the producing areas.

Table 1 U.S. Crude Oil and Natural Gas Production by PADD, 2002-2005

	PADD I	PADD II	PADD III	PADD IV	PADD V	United States Total
Crude Oil, thousand barrels						
2002	7,458	164,635	1,174,305	102,982	947,745	2,097,124
2003	7,170	161,360	1,162,869	105,931	636,123	2,073,453
2004	6,941	159,309	1,103,743	113,069	600,239	1,983,302
2005	8,299	161,587	1,023,499	123,956	572,765	1,890,106
Percent Change, 2002-2005	11.3	(1.9)	(12.8)	20.4	(39.6)	(9.9)
Dry Natural Gas, MMCF						
2002	453,774	2,432,537	12,622,766	2,641,749	776,962	18,927,788
2003	521,824	2,336,271	12,662,381	2,797,202	780,866	19,098,544
2004	520,240	2,428,676	11,960,955	2,935,503	745,517	18,590,891
2005	522,997	2,413,736	11,298,362	3,075,234	763,907	18,074,237
Percent Change, 2002-2005	15.3	(0.8)	(10.5)	16.4	(1.7)	(4.5)

Source: Energy Information Administration

Despite the common perception of being vertically integrated, the oil and gas industry is highly fragmented, especially at the exploration and production stage. Many companies concentrate exclusively on oil and gas production and have no interest in downstream operations such as pipelines, refineries and product distribution. Additionally, much of the work conducted in the producing fields is contracted to other companies that specialize in different aspects of drilling and maintaining the wells. Few of the operating companies operate their own drill rigs but instead contract with companies that specialize in drilling. Other companies specialize in different operations such as grading well locations, well surveying, running and pulling well casings, cementing wells, perforating well casings and reservoir treatment and stimulation. The operating, drilling and service companies collectively constitute the oil and gas exploration and production industry.

Many other industries benefit from spending by the oil and gas industry. These include consulting geologists and engineering companies, environmental consultants, vendors of oil field equipment, and pipeline and trucking companies. Spending by oil industry employees also benefits the local economy. These economic benefits beyond direct employment in the exploration and production

industry are known as indirect and induced benefits, and are the source of the "multiplier" effect. This study examines the structure of the Utah oil and gas exploration and production industry and the total economic impact on the producing areas.

3 Utah's Oil and Gas Industry

The Utah oil and gas industry started in 1891, when a water well being drilled in Farmington Bay near the Great Salt Lake encountered natural gas at a depth of 1,000 feet. Gas from several wells in this area was transported to Salt Lake City through wooden pipelines for several years until shifting sand in the lakebed plugged the wells. The first oil was found in the early 1900s near Rozel Point at the north end of the Great Salt Lake, near Mexican Hat in southeastern Utah, and near the town of Virgin in southwestern Utah. The first large-scale commercial oil well was drilled near Vernal in 1948. Since the early 1960s, Utah has consistently ranked in the top 15 oil-producing states and in recent years has experienced a dramatic rise in natural gas production. During 2005, Utah ranked 15th in crude oil production out of 31 states and two Federal Offshore Areas and 11th in dry natural gas production out of 33 states and the Federal Offshore Area in the Gulf of Mexico.

Utah is contributing to the recent growth in crude oil and natural gas production taking place in the Rocky Mountain states (PADD IV). The state's 2006 crude oil production of 17.9 million barrels was a 37 percent increase over the recent low of 13.1 million barrels produced in 2003 (Figure 4). Although a substantial increase from the recent past, 2006's output was still only 44 percent of the all-time high of 41.1 million barrels produced in 1985.

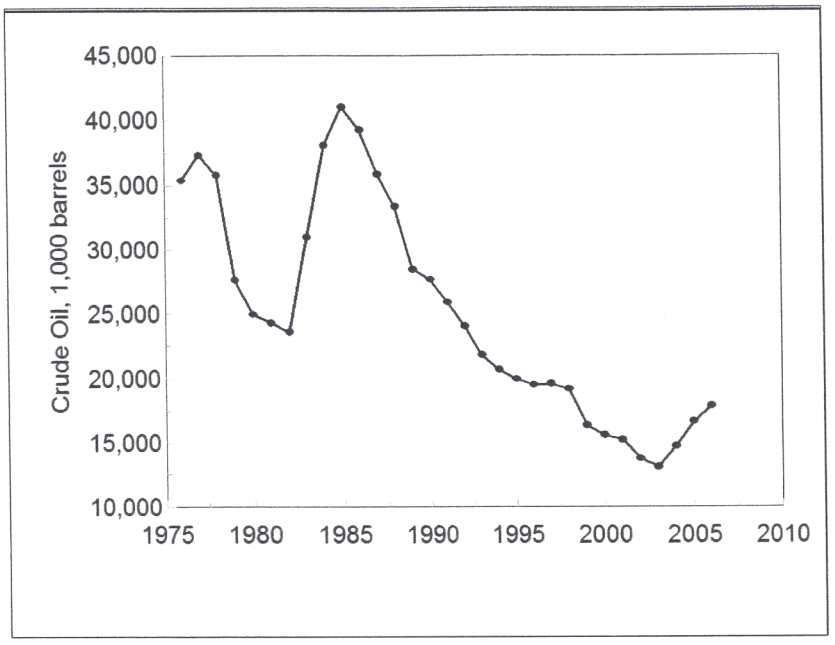


Figure 4 **Utah Crude Oil Production**
Source: Utah Division of Oil, Gas and Mining

There has been an even greater rise in natural gas production in Utah. In 2006, Utah's marketed natural gas production hit an all-time high of 343 BCF, up 502 percent from 57 BCF in 1976 (Figure 5).

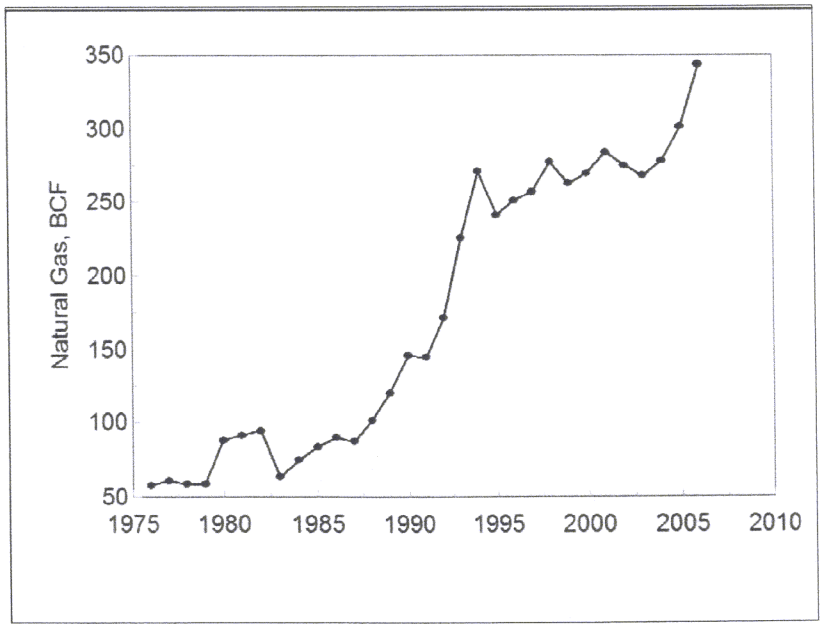


Figure 5 **Utah Marketed Natural Gas Production**
Source: Utah Geological Survey

Not all gross withdrawals of natural gas are marketed to consumers. Low prices of natural gas during the late 1980s and early 1990s resulted in much of the gas produced in Utah at the time not being marketable. A large portion of the gas withdrawn from wells in Utah during this period was reinjected into the geologic formations to maintain pressure and oil production. The amount of gas used for repressuring in Utah reached a high in 1983, when 65 percent of gross withdrawals were reinjected to maintain pressure. Currently, approximately 95 percent of natural gas withdrawals in Utah are marketed. Most of the gas that is not marketed is used for fuel at the production site or is accounted for by nonhydrocarbon gases that are removed from the production stream prior to marketing.

Average production per well of both crude oil and natural gas has been declining in Utah, so additional drilling will have to continue to maintain production at current levels. Although natural gas production has been steadily rising and crude oil production in Utah has rebounded in recent years, production per individual well has been declining. Natural gas production per gas well peaked at 740 MMCF in 1962. Production per well steadily declined to 67 MMCF in 2000 before rising to 84 MMCF in 2006. Similarly, crude oil production per oil well peaked at 57,330 barrels in 1959, then dropped to 6,727 barrels in 2003. Crude oil production per well in Utah averaged 7,308 barrels during 2006.

During 2006, 129 different operating companies reported crude oil and natural gas production to the Utah Division of Oil, Gas and Mining. Production occurred in 11 of Utah's 29 counties. Duchesne County had the highest oil production with 6,401,299 barrels while Uintah County led natural gas production with gross withdrawals of 204 BCF.

Six different areas in Utah currently have significant production of oil and/or natural gas. These areas are defined by geology. Additionally, these areas are somewhat isolated from one another economically, especially in terms of the oil and gas exploration and production (E&P) industry. The major oil and gas producing area in Utah is the Uinta Basin in the northeastern part of the state. Vernal is a center of the oil and gas industry in the Uinta Basin with many of the producing, drilling and service companies maintaining offices in the area. Other producing areas in Utah include both conventional plays and coalbed methane in Carbon and Emery Counties, the Paradox Basin in San Juan County, the Uncompahgre Uplift in Grand County, the Thrust Belt in Summit County and the recently discovered Hingeline in the central part of the state.

The Paradox Basin, Uncompahgre Uplift, and Thrust Belt all extend over state lines to adjacent states. Many of the workers involved in operating wells in these areas are actually employed in other states. Expanded gas operations in Carbon and

Emery Counties and new oil production in the Hingeline are fairly recent discoveries and an oil service industry has not developed in these areas.

Defining the oil and gas E&P industry is a key element for a study of this type. Economists use the numerical North American Industry Classification System (NAICS) developed by the Office of Management and Budget to classify industries for reporting employment and earnings. The two-digit NAICS codes are divided into 20 major industrial sectors. These two-digit major sectors are then further subdivided as necessary with the addition of more numerical digits after the first two.

The NAICS codes have three industrial subdivision classifications that directly apply to the oil and gas E&P industry. These are NAICS 211 – Oil and Gas Extraction, NAICS 213111 – Drilling Oil and Gas Wells, and NAICS 213112 – Support Activities for Oil and Gas Operations. For purposes of this study, these three industries are collectively considered the oil and gas E&P industry. Additional information on the NAICS codes for these three industries is available in Section 6.

The following section summarizes oil and gas production in Carbon and Emery Counties. Also included are economic data for Carbon and Emery Counties to place the oil and gas E&P industry in context.

3.1 Carbon and Emery Counties

For purposes of this report, the study area is defined as Carbon and Emery Counties, Utah. Coalbed methane production makes up a significant portion of the gas produced in the study area. Coalbed methane is reported as part of the natural gas production in Utah and when referring to production in the study area, the terms methane and natural gas are used synonymously in this report. Although there is potential for coalbed methane production from other coal deposits in Utah, and exploration has been conducted in other areas of the state, coalbed methane production has failed to materialize outside of Carbon and Emery.

The study area in central Utah has emerged as a significant coalbed methane producer over the past 15 years. Initial discoveries in the area were the conventional natural gas fields at Clear Creek in 1951 and at Ferron in 1957. Production noticeably increased in the early 1990s with discovery of the Drunkards Wash Field southwest of Price. Texaco Exploration and Production drilled two wells in 1988 and in 1991 River Gas Corporation took a 92,000-acre farmout from Texaco and commenced exploration. Between 1994 and 1997, exploratory drilling by Texaco established the Buzzard Bench Field between Huntington and Ferron. Meanwhile, Anadarko Petroleum Corp. established the Helper Field north of Price in 1993. Through a series of corporate buy-outs and mergers, ConocoPhillips has emerged as the major operator in the Drunkards Wash Field and is responsible for

almost half of total production in Carbon and Emery Counties. Coalbed methane development and production peaked in 2001-2002 and has declined since then. Recent discoveries of significant conventional gas deposits in deeper reservoirs by Bill Barrett Corporation in the Nine Mile and Peter's Point areas of northeastern Carbon County has brought renewed development activity to this area and started to reverse the overall gas production decline in 2006.

Carbon and Emery Counties contain just under 3.8 million acres (Table 2), with the federal government controlling nearly 72 percent of the land. The Bureau of Land Management is the major federal land-managing agency with responsibility for 2.5 million acres or 65 percent of the total. The U.S. Forest Service manages 6.3 percent of the land in the two counties. There is a small amount of National Park Service land where Capitol Reef National Park extends into the southwest corner of Emery County. With such a large portion of the land controlled by the federal government, the oil and gas E&P industry is highly sensitive to federal land management policy.

The majority of state land in the Carbon and Emery Counties is controlled by the Utah School and Institutional Trust Lands Administration (SITLA). SITLA administers 11.6 percent of the land in the two counties with the Utah Division of Wildlife Resources and the Utah Division of State Parks and Recreation controlling lesser amounts of land. There is a minor amount of Indian land along the Green River at the eastern edge of the two counties. Only 16.2 percent of the land in the two counties is privately held.

Table 2 Land Ownership in Carbon and Emery Counties

	Carbon County, acres	Emery County, acres	Two-County Area Total, acres	Percent of Total
Bureau of Land Management	419,835	2,062,072	2,481,907	65.3
US Forest Service	30,237	210,652	240,889	6.3
National Park Service	0	2,085	2,085	0.1
Total Federal	450,162	2,274,808	2,724,970	71.7
State Parks	0	394	394	0.0
State Wildlife Lands	13,857	2,837	16,694	0.4
State Trust Lands	110,029	331,854	441,883	11.6
Total State Lands	123,887	335,085	458,972	12.1
Indian Lands	73	37	110	0.0
Private	373,511	240,425	613,936	16.2
Total	947,632	2,850,356	3,797,988	100.0

Source: Utah Governor's Office of Planning and Budget

Production of both natural gas and crude oil in the study area has increased dramatically over the past 10 years, although there has been a decrease in natural

gas production in recent years. Although 2006 crude oil production in the two counties was nearly 10 times that of 1997, the area remains a minor producer of crude oil in Utah (Table 3). The 2006 production of 31,942 barrels of crude oil was 0.2 percent of statewide production.

Table 3 Carbon and Emery Counties Crude Oil Production, 1997-2006

	Crude Oil, barrels			
	Carbon County	Emery County	Two-County Area Total	State Total
1997	0	3,354	3,354	19,592,548
1998	0	3,662	3,662	19,223,542
1999	527	1,649	2,176	16,376,521
2000	211	3,279	3,490	15,609,030
2001	128	4,552	4,680	15,273,926
2002	46	2,493	2,539	13,770,860
2003	1,885	6,191	8,076	13,098,424
2004	4,661	4,657	9,318	14,799,208
2005	9,468	3,196	12,664	16,675,302
2006	27,906	4,036	31,942	17,926,580
Percent of State Total, 2006	0.2	0.0	0.2	100.00

Source: Utah Division of Oil, Gas and Mining

The study area is primarily a producer of natural gas, while oil production is minor, generally as an associated byproduct of gas production. Over the past 10 years, natural gas production in the area increased from 23.7 BCF in 1997 to 104.6 BCF in 2002 before declining to 98.5 BCF in 2006 (Table 4). Even with the decline from 2002, production in 2006 was over four times the level in 1997. During 2006, the two counties were responsible for 27.7 percent of natural gas production in Utah. Although Carbon County produces the bulk of the natural gas from the two counties, production in Emery County has been growing faster. From 1997 to 2006, natural gas production in Emery County increased by over 1,600 percent, while production in Carbon County increased by only 262 percent.

Table 4 Carbon and Emery Counties Natural Gas Production (Gross Withdrawals), 1997-2006

	Natural Gas, MCF			
	Carbon County	Emery County	Two-County Area Total	State Total
1997	22,760,216	926,911	23,687,127	272,553,774
1998	31,903,361	1,345,422	33,248,783	297,503,246
1999	50,175,216	2,317,596	52,492,812	277,494,312
2000	72,586,085	4,042,810	76,628,895	281,170,016
2001	86,532,946	7,718,744	94,251,690	300,975,578
2002	90,700,883	13,901,494	104,602,377	293,030,004
2003	85,179,739	17,213,152	102,392,891	287,141,238
2004	79,238,531	17,443,464	96,681,995	293,735,994
2005	74,822,590	16,606,967	91,429,557	313,465,305
2006	82,337,741	16,199,707	98,537,448	356,361,028
Percent of State Total, 2006	23.1	4.5	27.7	100.0

Source: Utah Division of Oil, Gas and Mining

Drilling activity in the two counties reflects the rise in natural gas production that occurred in the late 1990s (Table 5). Drilling peaked with 148 wells spudded in 2001. At the time, the two counties accounted for 23.6 percent of all wells spudded in the state. Drilling declined to only 36 wells spudded in 2004, but rising gas prices stimulated additional drilling activity and the number of wells spudded hit 78 in 2006. The number of wells drilled in the area can be expected to continue to rise in the future. In September 2005, Bill Barrett Corporation announced plans and began work on an environmental impact statement to drill 750 new gas wells in the West Tavaputs area of northeast Carbon County.

Table 5 Wells Spudded in Carbon and Emery Counties, 1997-2006

	Wells Spudded			
	Carbon County	Emery County	Two-County Area Total	State Total
1997	41	23	64	430
1998	74	3	77	430
1999	110	16	126	283
2000	122	55	144	540
2001	104	44	148	627
2002	51	53	104	391
2003	34	14	45	480
2004	32	4	36	659
2005	59	27	86	889
2006	57	21	78	1,057
Percent of State Total, 2006	5.4	2.0	7.4	100.00

Source: Utah Division of Oil, Gas and Mining

3.1.1 Carbon and Emery Counties Economy

While production of both crude oil and natural gas is increasing in the Carbon and Emery Counties, this increase must be placed in the context of the complete economy for the two counties.

The two counties had an estimated 2006 population of 29,942, down 1.5 percent from 2002 (Table 6). Major cities include Price, with an estimated 2006 population of 8,010, Huntington (2,061), Helper (1,886), Castle Dale (1,617), Wellington (1,570) and Ferron (1,569). The 2000 Decennial Census determined that 40.5 percent of the population lives in the urban area of Price. The remainder of the two counties are not densely enough populated to be considered urban.[2] Although it contained over 40 percent of the population of the two counties, Price accounts for only 0.15 percent of the area in the two counties.

[2]The Bureau of the Census defines urban areas as census blocks that have a population density of at least 1,000 persons per square mile and surrounding census blocks with a population density of 500 persons per square mile. Adjacent census blocks with a lower population density are also included if they meet criteria established by the Bureau of the Census.

Table 6 Carbon and Emery Counties Population, 2002-2006

	Population			
	Carbon County	Emery County	Two-County Area Total	State Total
2002	19,858	10,540	30,398	2,358,330
2003	19,558	10,477	30,035	2,413,618
2004	19,385	10,493	29,878	2,469,230
2005	19,338	10,491	29,829	2,547,389
2006	19,504	10,438	29,942	2,615,129
Source: Utah Population Estimates Committee				

The study area is benefitting economically from the boom in energy prices, with the unemployment rate dropping from 8.3 percent in January 2004 to 3.8 percent in September 2007 (Figure 6). Since energy prices have been increasing, employment in the study area has steadily risen, from 13,000 persons in January 2003 to 15,299 persons in September 2007. Although the unemployment rate in the area has been dropping, it has consistently been above the state average since the beginning of 1997.

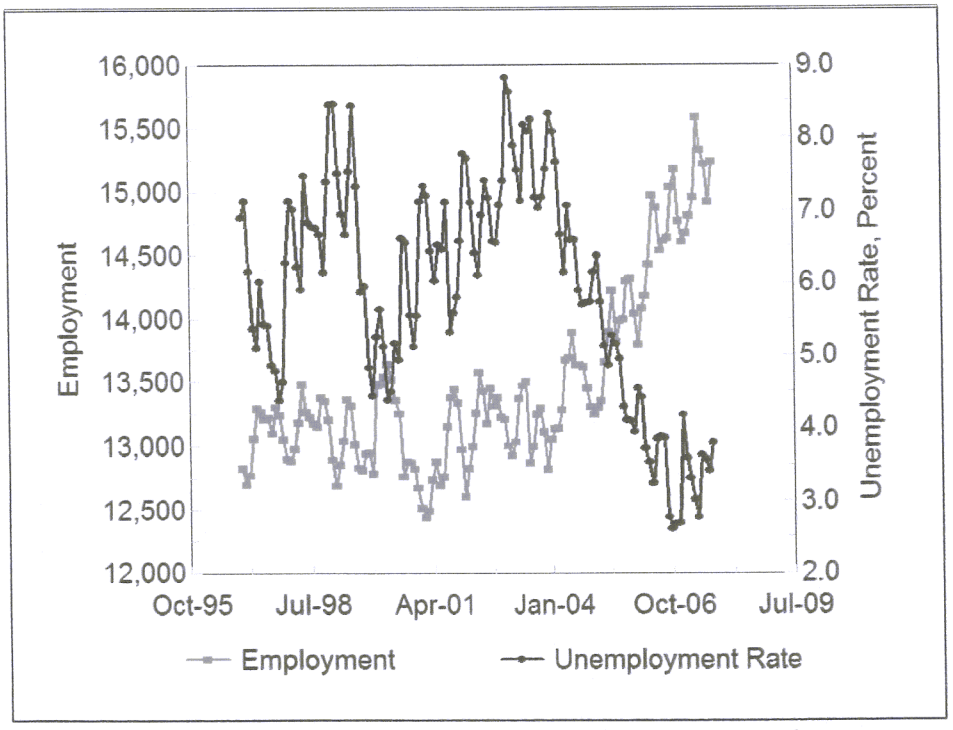


Figure 6 Employment and the Unemployment Rate in Carbon and Emery Counties
Source: BLS, Local Area Unemployment Statistics

The industrial structure of the two counties has significant differences from that of the state of Utah (Table 7). Mining (NAICS 21) constitutes a significant portion of the economy with both coal mining and oil and gas production figuring prominently. There is also one gypsum operation in Emery County and several sand and gravel operations. Approximately 90 percent of the Mining (NAICS 21) employment in the two counties is due to coal mining, not oil and gas production. Although coal mining employment is not disclosable by federal data agencies because of the small number of firms, the Utah Geological Survey determined that coal mining employment was 1,657 jobs in the two counties during 2006.

Utilities (NAICS 22) are also a major portion of the area's economy due to the presence of three coal-fired power plants with a total summer generating capacity of 2,387 MW. The Hunter Plant (1,320 MW) is located south of Castle Dale and the Huntington Plant (895 MW) is sited at the mouth of Huntington Canyon near Huntington; both are located in Emery County. The Carbon Plant (172 MW) is in Price Canyon north of Price in Carbon County. Although Utility industry (NAICS 22) employment is not disclosable for Emery County due to the concentration of employment in one company, the presence of the three power plants results in the electric utility industry being an important component of the area's economy.

Several other major industries have employment data that are not disclosable for Carbon or Emery Counties. This is done to protect individual company data. In Carbon County, besides Mining, employment data are nondisclosable for Agriculture, Forestry, Fishing and Hunting (NAICS 11); Educational Services (NAICS 61); and Health Care (NAICS 62). Emery County has a smaller economy than Carbon County and has eight industries with nondisclosable data. These are the same industries that were nondisclosable in Carbon plus Utilities (NAICS 22), Wholesale Trade (NAICS 42), Management of Companies and Enterprises (NAICS 55), and Administrative and Support (NAICS 56). Since employment numbers are not reported for these industries, location quotients[3] can not be calculated.

Industries for which employment was reported and which have low location quotients in the study area include Manufacturing (NAICS 31-32); Real Estate (NAICS 53); Professional, Scientific and Technical Services (NAICS 54); and Arts, Entertainment and Recreation (NAICS 71). Manufacturing has a location quotient of 0.32, indicating that the area is only 32 percent as dependent on Manufacturing for employment as is the state of Utah.

[3]Location Quotients are the ratio of an industry's share of employment in a study are, in this case Carbon and Emery Counties, to its share in a reference area, e.g., the state of Utah.

Table 7 Employment by Industry in Carbon and Emery Counties, 2006

	Carbon County	Emery County	Two-County Area	Distribution, Percent	Location Quotient
Private Employment					
Agriculture, Forestry, Fishing and Hunting (NAICS 11)	ND	ND	ND	NA	NA
Mining (NAICS 21)	ND	ND	ND	NA	NA
Utilities (NAICS 22)	138	ND	ND	NA	NA
Construction (NAICS 23)	393	338	731	5.6	0.69
Manufacturing (NAICS 31-32)	418	17	435	3.4	0.32
Wholesale Trade (NAICS 42)	450	ND	ND	NA	NA
Retail Trade (NAICS 44-45)	1,286	433	1,719	13.3	1.10
Transportation and Warehousing (NAICS 48-49)	300	135	435	3.4	0.92
Information (NAICS 51)	127	132	259	2.0	0.75
Finance and Insurance (NAICS 52)	192	52	244	1.9	0.41
Real Estate (NAICS 53)	59	6	65	0.5	0.33
Professional, Scientific and Technical Services (NAICS 54)	220	59	279	2.2	0.41
Management of Companies and Enterprises (NAICS 55)	58	ND	ND	NA	NA
Administrative and Support (NAICS 56)	371	ND	ND	NA	NA
Educational Services (NAICS 61)	ND	ND	ND	NA	NA
Health Care (NAICS 62)	ND	ND	ND	NA	NA
Arts, Entertainment and Recreation (NAICS 71)	71	0	71	0.5	0.37
Accommodation and Food Services (NAICS 72)	742	169	911	7.0	0.90
Other Services (NAICS 81)	342	143	485	3.7	1.50
Government Employment	1,978	823	2,801	21.6	1.32
Total Employment	9,067	3,887	12,954	100.0	1.00

ND: Not disclosed to protect individual company information. NA: Not Applicable.
Source: BLS, Quarterly Census of Employment and Wages

Both the concentration of the coalbed methane industry and its recent development in Carbon and Emery Counties are reflected in the employment data released by the Bureau of Labor Statistics (Table 8). If an industry is dominated by one company in an area, data are not released to prevent disclosure of individual company data. Much of the employment data specific to the oil and gas industry is not disclosable in Carbon and Emery Counties. Two characteristics of the industry in the two counties contribute to this. First, few operating companies maintain offices in the area. Only three operating companies (NAICS 211) reported employment in the area during 2006. The three companies were all located in Carbon County. The Drunkards Wash Field in Carbon County, currently operated by ConocoPhillips, is sufficiently large compared to other fields in the area that employment is concentrated in one company. Second, since the coalbed methane industry is a relatively recent development in the area, with major production occurring over the past 15 years, a sizable oil and gas service industry has not developed in the two counties, resulting in employment for drilling and service companies not being disclosable.

Table 8 Oil and Gas E&P Employment in Carbon and Emery Counties, 2001-2006

	NAICS 211 Oil and Gas Extraction	NAICS 213111 Drilling Oil and Gas Wells	NAICS 213112 Support Activities for Oil and Gas Operations
Carbon County			
2001	ND	0	19
2002	ND	0	ND
2003	ND	ND	44
2004	ND	ND	32
2005	ND	ND	ND
2006	ND	ND	ND
Emery County			
2001	0	0	ND
2002	0	0	ND
2003	0	0	ND
2004	ND	0	ND
2005	0	0	ND
2006	0	0	ND

ND: Not disclosed to protect individual company data.
Source: BLS, Quarterly Census of Employment and Wages

In the absence of data from the government statistical agencies, operating companies with offices in the area were contacted to obtain employment information. Currently, three operating companies maintain offices in the two

counties and directly employ 72 persons. Data obtained from these companies indicate that the average annual wage paid by companies in the Oil and Gas Extraction industry (NAICS 211) in the area is approximately $52,000 annually. Data from the Bureau of Labor Statistics indicates that the average annual wage in Carbon County for the Support Activities for Mining industry (NAICS 213) was $43,100 during 2006. Both the well drilling companies (NAICS 213111) and service companies (NAICS 213112) are subsets of the Support Activities for Mining (NAICS 213) industry and should pay similar wages.

Of the major industries in the two counties, only coal mining, Construction and Utilities pay a higher average wage (Table 9). The average wage for coal mining for the two counties is not disclosed by the government statistical agencies, but the statewide average annual wage for coal mining was $62,666 in 2006. Since 82 percent of the coal mining employment in Utah is located in Carbon and Emery Counties, the wage in these counties should be close to the statewide average. The average annual wage for Utilities in Carbon County was $81,156 in 2006. Since the majority of employment in the Utilities industry in both counties are power plant operators, the average annual wage for the industry in Emery County should be similar. The average wage for Construction was $56,139 in Carbon County and $38,988 in Emery County during 2006.

Table 9 Average Annual Wage by Industry in Carbon and Emery Counties, 2006

	Carbon County	Emery County
Private Employment		
Agriculture, Forestry, Fishing and Hunting (NAICS 11)	ND	ND
Mining (NAICS 21)	ND	ND
Utilities (NAICS 22)	$81,156	ND
Construction (NAICS 23)	56,139	$38,988
Manufacturing (NAICS 31-32)	44,177	31,440
Wholesale Trade (NAICS 42)	44,491	ND
Retail Trade (NAICS 44-45)	19,084	13,226
Transportation and Warehousing (NAICS 48-49)	35,915	33,142
Information (NAICS 51)	20,694	30,837
Finance and Insurance (NAICS 52)	28,541	21,634
Real Estate (NAICS 53)	17,345	3,521
Professional, Scientific and Technical Services (NAICS 54)	16,938	29,393
Management of Companies and Enterprises (NAICS 55)	45,990	ND
Administrative and Support (NAICS 56)	20,550	ND
Educational Services (NAICS 61)	ND	ND
Health Care (NAICS 62)	ND	ND
Arts, Entertainment and Recreation (NAICS 71)	11,612	0
Accommodation and Food Services (NAICS 72)	9,066	10,551
Other Services (NAICS 81)	22,390	36,379
Government Employment	30,401	26,789
All Employment	32,603	39,864

ND: Not disclosed to protect individual company information.
Source: BLS, Quarterly Census of Employment and Wages

4 Economic Impacts

While rising energy prices are translating into rising employment and wages in the producing areas, not all of the economic gains are occurring in the oil and gas industry. The total increase in local economic conditions due to oil and gas activity is greater than the direct gain in the industry. This is the "multiplier effect" often referred to in economics and is a result of local spending by the industry for goods and services and spending of wages by the industry's employees. These additional economic benefits are known as the indirect and induced benefits.

In this study, economic impact is defined as the effect on employment and wages in the subject areas. Additional information on economic impact is available in Section 6 and in several listed references.

4.1 Carbon and Emery Counties

The study area of Carbon and Emery Counties is an important component of the oil and gas E&P industry in Utah. In turn the industry is becoming more important to the local economy as additional wells are drilled, resulting in rising employment and

wages. Since the industry is a relatively recent development in the area, many of the service companies have not established a permanent presence there but work out of offices in the Uinta Basin. Employment in the two counties in the oil and gas E&P industry is estimated at 137 persons, or 1.1 percent of total employment during 2006 (Table 10). Due to the industry paying higher than average wages, total wages in the area are estimated at $6.5 million, or 1.5 percent of total wages for 2006.

Table 10 Direct Employment and Wages in the E&P Industry in Carbon and Emery Counties, 2006

	Carbon and Emery Counties Total	
	Employment	Wages, $1,000
Total	12,954	450,623
E&P Industry, Direct	137	6,546
E&P Industry, percent of total	1.1	1.5

Source: BLS, Quarterly Census of Employment and Wages; Utah Department of Workforce Services FirmFind; interviews with companies; author's estimates.

In addition to the direct employment, additional jobs and wages due to spending by the industry and employees results in significant economic benefits to the study area. Other employment due to spending by the E&P industry is not limited to the mining industry but is distributed throughout different industries. Total employment in the two-county area due to the E&P industry, including direct, indirect, and induced, was estimated at 4.0 percent of total jobs in the area in 2006 (Table 11). When examining employment by industry, the oil and gas industry is shown to have significant effects on several other industries.

The E&P industry is responsible for 14.1 percent of total employment in the Construction industry in Carbon and Emery Counties. Additionally, 7.1 percent of the Real Estate employment in the area is due to oil and gas operations. There are an estimated 10 additional mining jobs in the area due to the oil and gas operations; these jobs are in addition to the estimated 137 jobs directly in the E&P industry. When considering both the direct jobs and the additional indirect and induced jobs in the mining industry, the oil and gas E&P industry is responsible for 8.1 percent of total mining jobs in the two counties, based on Utah Geological Survey estimates of coal mining employment in the area. The coal mining industry, which is much more labor intensive, is responsible for the bulk of the remaining mining jobs.

Although there are government employees located in the Coalbed Methane Area to regulate the oil and gas industry, these are not considered part of the Mining industry. The state Division of Oil, Gas and Mining has an office in Price and there are also local BLM and USFS employees dedicated to regulating the industry. For purposes of employment classification, these employees are considered to be

employed in NAICS 92 – Public Administration, which is included in the government employment in Table 11.

Table 11 Employment Due to Oil and Gas E&P in Carbon and Emery Counties, 2006

	Two-County Area Total Employment	Total Employment Due to Oil and Gas E&P	Oil and Gas E&P Employment, percent of total
Private Employment			
Agriculture, Forestry, Fishing and Hunting (NAICS 11)	ND	1	NA
Mining (NAICS 21)	1,804	147	8.1
Utilities (NAICS 22)	ND	44	NA
Construction (NAICS 23)	731	103	14.1
Manufacturing (NAICS 31-32)	435	5	1.2
Wholesale Trade (NAICS 42)	ND	10	2.1
Retail Trade (NAICS 44-45)	1,719	68	4.0
Transportation and Warehousing (NAICS 48-49)	435	16	3.7
Information (NAICS 51)	259	4	1.4
Finance and Insurance (NAICS 52)	244	6	2.3
Real Estate (NAICS 53)	65	5	7.1
Professional, Scientific and Technical Services (NAICS 54)	279	4	1.5
Management of Companies and Enterprises (NAICS 55)	ND	1	NA
Administrative and Support (NAICS 56)	ND	10	NA
Educational Services (NAICS 61)	ND	11	NA
Health Care (NAICS 62)	ND	25	NA
Arts, Entertainment and Recreation (NAICS 71)	71	3	3.6
Accommodation and Food Services (NAICS 72)	911	34	3.7
Other Services (NAICS 81)	485	27	5.5
Households	NA	2	NA
Government Employment	2,801	NA	NA
All Employment	12,954	524	4.0

ND: Nondisclosable. Data are included in the totals. NA: Not applicable.
Source: BLS, Quarterly Census of Employment and Wages; author's calculations.

Oil and gas E&P accounts for just under five percent of all wages paid in the two counties (Table 12). The industry is responsible for a higher percentage of wages than employment due to oil and gas E&P paying above average wages. The oil and gas industry is responsible for 6.6 percent of an estimated $111 million in wages in the Mining (NAICS 21) industry in the two counties. Both the Construction (NAICS 23) and Real Estate (NAICS 53) industries have more than 10 percent of their total wages due to spending by the oil and gas industry.

Table 12 Wages Due to Oil and Gas E&P in Carbon and Emery Counties, 2006

	Two-County Area Total Wages, $1,000	Total Wages Due to Oil and Gas E&P, $1,000	Oil and Gas E&P Wages, percent of total
Private Employment			
Agriculture, Forestry, Fishing and Hunting (NAICS 11)	ND	9	NA
Mining (NAICS 21)	111,000	7,359	6.6
Utilities (NAICS 22)	ND	3,891	NA
Construction (NAICS 23)	35,249	4,241	12.0
Manufacturing (NAICS 31-32)	18,992	260	1.4
Wholesale Trade (NAICS 42)	ND	458	2.3
Retail Trade (NAICS 44-45)	30,198	1,542	5.1
Transportation and Warehousing (NAICS 48-49)	15,243	945	6.2
Information (NAICS 51)	6,713	191	2.8
Finance and Insurance (NAICS 52)	6,599	218	3.3
Real Estate (NAICS 53)	1,044	117	11.2
Professional, Scientific and Technical Services (NAICS 54)	5,450	207	3.8
Management of Companies and Enterprises (NAICS 55)	ND	56	NA
Administrative and Support (NAICS 56)	ND	214	NA
Educational Services (NAICS 61)	ND	233	NA
Health Care (NAICS 62)	ND	924	NA
Arts, Entertainment and Recreation (NAICS 71)	825	44	5.4
Accommodation and Food Services (NAICS 72)	9,660	530	5.5
Other Services (NAICS 81)	12,846	678	5.3
Households	NA	36	NA
Government Employment	82,266	NA	NA
All Employment	450,623	22,151	4.9

ND: Not disclosed. NA: Not applicable.
Source: BLS, Quarterly Census of Employment and Wages; author's calculations.

5 Fiscal Impacts

The oil and gas industry also has fiscal impacts on the local areas. Fiscal impacts refer to impacts on government finances and tax collections. The oil and gas industry is subject to the tax laws common to all businesses. There are also impacts unique to the industry. Production on federal land is subject to a royalty payment under the Mineral Lands Leasing Act of 1920. This royalty is paid to the Minerals Management Service, an agency within the U.S. Department of Interior. A portion of the federal mineral royalties is returned to the state of origin, generally one-half. Royalties from production on Indian lands are returned to the appropriate tribe, not to the state government. Since a large portion of the crude oil production in Utah occurs on Indian lands, especially in Duchesne and San Juan Counties, the amount of crude oil royalty returned to the state government is significantly less than one-half of the amount paid to the Minerals Management Service. The states have full discretion as to the distribution of federal mineral royalties as long as priority is given to areas with economic and/or social impacts from leasing activities. The

Minerals Management Service does not release federal mineral royalty data at the county level, but statewide data are available.

Federal mineral royalties due to oil and gas production in Utah have increased dramatically from $91 million in 2001 to nearly $300 million in 2006, a 228 percent rise (Table 13). Oil and gas production accounted for 91.3 percent of the royalties paid for mineral production on federal land in Utah during 2006. There was also an additional $103 million paid in bonuses and rents on federal mineral leases. These are fees associated with awarding federal mineral leases and maintaining the leases until production is initiated. Table 13 includes royalties due to oil and gas production, but does not include bonus or rent payments for federal oil and gas leases. Of the nearly $300 million paid in federal mineral royalties by the oil and gas industry in Utah, $109 million was returned to the state government.

Table 13 Federal Mineral Royalty Payments and Disbursements for Utah, 2001-2006

	Oil		Natural Gas		Total	
	Royalties	Disbursements	Royalties	Disbursements	Royalties	Disbursements
2001	$32,799,794	$4,392,667	$58,553,527	$26,210,621	$91,353,321	$30,603,288
2002	26,028,911	3,493,794	37,653,050	11,921,373	63,681,961	15,415,167
2003	37,462,357	5,575,810	55,369,036	26,040,706	92,831,293	31,616,515
2004	45,743,590	7,235,629	87,075,857	38,228,494	132,819,447	45,464,122
2005	66,900,212	10,405,687	118,132,687	53,647,636	185,032,900	64,053,323
2006	106,457,298	21,866,066	193,416,183	87,551,457	299,873,481	109,417,522

Note: Years are federal fiscal years. Natural gas includes natural gas liquids from gas processing plants.
Source: Minerals Management Service

In Utah, federal mineral royalties are distributed to several different accounts according to state law (Table 14). The largest recipients of federal mineral royalties in Utah are the Permanent Community Impact Fund and the Department of Transportation. The funds distributed to the Department of Transportation are then distributed to local governments to fund local highways in proportion to the amount of mineral lease money generated by each county. The Permanent Community Impact Fund makes loans and grants to state agencies and subdivisions of state government impacted by mineral resource development. Unlike the funds administered by the Department of Transportation, which are distributed in proportion to royalties generated in the county, the Permanent Community Impact Fund is distributed by a state-appointed board in response to proposals submitted by state agencies and local governments. Therefore, the distribution of funds by the Permanent Community Impact Fund to the various counties may vary from the amount of royalty generated. The payments in lieu of taxes cited in Table 14 are not the payments in lieu of taxes made by the federal government for federal land in Utah but are payments made by the state government to counties for lands

controlled by the School and Institutional Trust Lands Administration, state Division of Parks and Recreation and the state Division of Wildlife Resources.

Table 14 Distribution of Federal Mineral Royalties in Utah

	Percent
Permanent Community Impact Fund	32.50
State Board of Education	2.25
Utah Geological Survey	2.25
Water Research Laboratory	2.25
Department of Transportation	40.00
Department of Community and Culture	5.00
Payments in Lieu of Taxes	52 cents per acre
Permanent Community Impact Fund	Remainder

Note: The amount paid for Payments in Lieu of Taxes has been adjusted annually since 1994 according to the Consumer Price Index.
Source: Utah State Code, Title 59, Chapter 21.

The School and Institutional Trust Lands Administration (SITLA) controls mineral rights on approximately 4.4 million acres in Utah. These lands are held in trust for the public schools in Utah and 11 other beneficiaries. They were established at statehood and through land exchanges with the federal government. During 2006, royalties paid for oil and gas extraction on SITLA lands totaled $82.7 million. This was 51.0 percent of total SITLA revenue for 2006. These funds are not returned to the county of origin, but are placed in a permanent fund managed by the state treasurer on behalf of the public schools or distributed to the appropriate beneficiary as mandated. Dividends and interest from the Public School Fund are distributed annually to all Utah public schools based on an established formula.

In addition to royalties, there is an Oil and Gas Severance Tax in Utah and an Oil and Gas Conservation Fee that are levied on all production in the state. Revenue from the Oil and Gas Severance Tax is placed in the state general fund and the tax rate varies from 3 to 5 percent of the sales price. The Oil and Gas Conservation Fee funds the state Division of Oil, Gas and Mining. The fee is imposed at a rate of 0.2 percent of the value of production.

Both the Oil and Gas Severance Tax and the Oil and Gas Conservation Fee have significantly increased in recent years (Table 15). The Oil and Gas Severance Tax increased by 82 percent from 2001 to 2006, while the Oil and Gas Conservation Fee increased by 102 percent. The drop from 2001 to 2002 was due to the decline of the wellhead price of natural gas produced in Utah from $3.52 per MCF to $1.99 per MCF. These data reflect statewide oil and gas operations and are not specific to Carbon and Emery Counties.

Table 15 State Tax Collections Related to Oil and Gas Production, 2001-2006

	Oil and Gas Severance Tax	Oil and Gas Conservation Fee
2001	$39,357,798	$2,748,318
2002	18,893,082	1,710,219
2003	26,745,279	1,943,755
2004	36,659,808	2,696,250
2005	53,484,320	3,631,963
2006	71,513,869	5,560,449

Note: Years are state fiscal years.
Source: Utah State Tax Commission

5.1 Carbon and Emery Counties

The largest direct fiscal impacts on Carbon and Emery Counties due to oil and gas operations in the area are property taxes paid by the operating companies and federal mineral royalties distributed to the local governments by the Utah Department of Transportation. The Utah State Tax Commission centrally assesses oil and gas properties using a net present value approach applied to future production. The local county treasurers bill and collect the taxes. Property taxes are levied by numerous units of local government, including county and city governments, school districts, and special service districts.

Property taxes paid on oil and gas properties have become a significant portion of total property taxes in the two counties (Table 16). During 2006, the oil and gas industry paid nearly 25 percent of total property taxes in the two counties. Over one-third of the property tax paid in Carbon County during 2006 was due to oil and gas production and just over one-tenth of the property tax in Emery County was due to oil and gas. The two large power plants located in Emery County mean that 65 percent of property taxes in Emery County are paid by the utilities industry. Table 16 refers to all property taxes paid to various government entities in the two counties, not just the county governments. As the price of natural gas has increased in recent years, the net present value of future production has increased. This, coupled with rising production, has resulted in the amount of property taxes paid by the oil and gas industry in the two counites increasing by over 25 times over the past 10 years, not adjusting for inflation. Oil and gas property taxes have been rising faster in Emery County than in Carbon County, reflecting rising natural gas production in the county. Property taxes paid on oil and gas production increased by 4,622 percent in Emery County from 1997 to 2006, and by 2,155 percent in Emery County. Given the rising production and expected continuation of current energy prices, the property taxes paid by the oil and gas production industry in the two counties should continue to rise into the future.

Table 16 Oil and Gas Property Tax Payments in Carbon and Emery Counties, 1997-2006

	Carbon County		Emery County		Two-County Area Total	
	Oil & Gas Property Tax	Percent of Total Property Tax	Oil & Gas Property Tax	Percent of Total Property Tax	Oil & Gas Property Tax	Percent of Total Property Tax
1997	$359,255	3.0	$44,722	0.2	$403,977	1.2
1998	653,781	4.9	56,297	0.3	710,078	2.2
1999	1,233,733	10.2	144,661	0.7	1,378,394	4.4
2000	3,316,312	22.2	237,473	1.2	3,553,785	10.4
2001	4,779,864	28.0	547,486	2.8	5,327,350	14.4
2002	4,290,845	26.5	755,816	4.1	5,046,661	14.6
2003	4,567,518	24.5	985,587	5.5	5,553,105	15.1
2004	6,576,519	32.8	1,496,054	8.2	8,072,573	21.1
2005	7,418,552	38.7	1,836,886	10.2	9,255,438	24.9
2006	8,101,170	35.8	2,111,766	10.9	10,212,936	24.3

Source: Utah State Tax Commission, Property Tax Division Annual Reports

In terms of property taxes paid, the oil and gas industry has a greater fiscal impact on Carbon and Emery Counties than does the coal mining industry. In 2006, property taxes charged against coal mines in the two counties totaled $3,483,001, or 34.1 percent of the amount charged against oil and gas wells.

The funds generated through federal mineral royalties that are returned to the two counties through the Utah Department of Transportation are also a significant source of revenue for the local governments. These funds actually exceed the amount of property tax paid by the oil and gas industry. During 2006, Carbon and Emery Counties collectively received $13.7 million dollars in federal mineral royalties returned to them by the Department of Transportation (Table 17). This was a 70 percent increase over the amount returned in 2001.

Table 17 Federal Mineral Royalties Returned by UDOT to Carbon and Emery Counties, 2001-2006

	Carbon County	Emery County	Two-County Area Total
2001	$5,140,732	$2,900,800	$8,041,532
2002	2,260,889	1,703,743	3,964,632
2003	3,233,674	2,208,352	5,442,026
2004	5,421,384	3,761,439	9,182,823
2005	7,050,220	4,082,628	11,132,848
2006	10,145,446	3,566,833	13,712,279

Note: Years are state fiscal years.
Source: Utah Department of Transportation

Table 17 includes data on all royalties from federal mineral leases in Utah, not just oil and gas operations. There is significant coal production from federal leases in the two counties and a major portion of the federal mineral royalties returned by UDOT may be due to coal production. Almost all federal mineral royalties in the two counties are the result of energy production, whether coal, oil or natural gas. The rise in energy prices in recent years, coupled with the resultant production increases, has had a noticeable fiscal impact on the two counties.

Royalties paid to SITLA due to production of oil and gas in Carbon and Emery Counties dropped slightly from 2005 to 2006 (Table 18).

Table 18 Royalties Paid for Production on SITLA Lands in Carbon and Emery Counties, 2005-2006

	Carbon County	Emery County	Two-County Area Total
2005	$21,077,378	$5,775,864	$26,853,242
2006	19,786,589	5,355,106	25,141,695

Note: Years are state fiscal years.
Source: School and Institutional Trust Lands Administration

Most of the Drunkards Wash Field is on land controlled by SITLA and SITLA receives royalties for oil and gas production. Previous, the Drunkards Wash area was administered by the BLM but was acquired by SITLA in 1998 as part of a land exchange agreement with the federal government. Since there were preexisting federal leases in the area, the agreement stated the two county governments would not lose federal mineral royalties as a result of the land exchange. Originally, SITLA remitted one-half of the royalties received from the Drunkards Wash Field (after deducting a 3 percent administrative fee) to the state Mineral Lease Account. This account also receives federal mineral royalties returned to the state by the federal government and the funds deposited by SITLA were mingled with federal mineral royalties and distributed according to state law (Table 14). The other half of the royalties from the Drunkards Wash Field are retained by SITLA for disbursement to the various beneficiaries.

As of March 15, 2007, Utah state law changed and royalties from the Drunkards Wash Field previously deposited in the state Mineral Lease Account are now returned by the state Division of Finance to the county of origin. Between March 15, 2007 and the end of September 2007, $2.3 million had accrued with the state Division of Finance and were awaiting distribution to the two county governments.

Fiscal effects also arise from the direct, indirect and induced impacts of the oil and gas E&P industry. State personal income taxes as a result of oil and gas E&P activities in the two counties are estimated at $681,000 for 2006 (Table 19).

Table 19 Personal State Income Taxes Due to Oil and Gas E&P in Carbon and Emery Counties

	Two-County Area Total
Total Wages due to Oil and Gas E&P, $1,000	22,151
Personal State Income Taxes, $1,000	681
Source: Author's Calculations. Details of the estimation are in Section 6.	

6 Technical Notes and Methodology

Industries are classified by economists according to the North American Industry Classification System (NAICS), which was developed by the Office of Management and Budget in cooperation with other federal agencies and foreign governments (Office of Management and Budget, 2007). The NAICS codes replaced the Standard Industrial Classification (SIC) Codes that had been used since the 1930s. This change was prompted by structural changes in the U.S. economy, with the services sector becoming a much larger portion of the economy and more complex than when the SIC codes were developed. In the switch, the 10 major industrial sectors under the SIC codes were replaced with 20 major sectors under the NAICS codes. Many of the industrial sectors under the SIC codes were split among two or more of the redefined NAICS sectors, making comparisons difficult. The NAICS codes better explain the structure of the current economy but make time series data difficult to compile.

Under the NAICS system, 20 major industrial categories are further subdivided as needed. To demonstrate the level of detail obtained, Table 20 presents the divisions of the Mining (NAICS 21) sector. The Mining sector is divided into a total of 28 different industries. The other 19 industrial sectors are similarly subdivided.

Other local businesses and industries benefit from E&P activities. Examples of these are seismic companies, regulatory and environmental consulting firms, consulting geologists, trenching and dirtwork, and electric utilities. Other benefits accrue to local hotels and restaurants as a result of spending by visiting workers. These types of effects are referred to as the indirect and induced impacts. The indirect and induced impacts can be calculated from the value of transactions between the E&P industry and these other businesses using input-output economic models.

Table 20 NAICS Codes Related to the Mining Industry

NAICS Code	Industry
21	Mining, Quarrying, and Oil and Gas Extraction
211	Oil and Gas Extraction
2111	Oil and Gas Extraction
21111	Oil and Gas Extraction
211111	Crude Petroleum and Natural Gas Extraction
211112	Natural Gas Liquid Extraction
212	Mining (except Oil and Gas)
2121	Coal Mining
21211	Coal Mining
212111	Bituminous Coal and Lignite Surface Mining
212112	Bituminous Coal Underground Mining
212113	Anthracite Mining
2122	Metal Ore Mining
21221	Iron Ore Mining
212210	Iron Ore Mining
21222	Gold and Silver Ore Mining
212221	Gold Ore Mining
212222	Silver Ore Mining
21223	Copper, Nickel, Lead and Zinc Mining
212231	Lead Ore and Zinc Ore Mining
212234	Copper Ore and Nickel Ore Mining
21229	Other Metal Ore Mining
212291	Uranium-Radium-Vanadium Ore Mining
212299	All Other Metal Ore Mining
2123	Nonmetallic Mineral Mining and Quarrying
21231	Stone Mining and Quarrying
212311	Dimension Stone Mining and Quarrying
212312	Crushed and Broken Limestone Mining and Quarrying
212313	Crushed and Broken Granite Mining and Quarrying
212319	Other Crushed and Broken Stone Mining and Quarrying
21232	Sand, Gravel, Clay and Ceramic and Refractory Minerals Mining and Quarrying
212321	Construction Sand and Gravel Mining
212322	Industrial Sand and Gravel Mining
212324	Kaoline and Ball Clay Mining
212325	Clay and Ceramic and Refractory Minerals Mining
21239	Other Nonmetallic Mineral Mining and Quarrying
212391	Potash, Soda, and Borate Mineral Mining
212392	Phosphate Rock Mining
212393	Other Chemical and Fertilizer Mineral Mining
212399	All Other Nonmetallic Mineral Mining
213	Support Activities for Mining
2131	Support Activities for Mining
21311	Support Activities for Mining
213111	Drilling Oil and Gas Wells
213112	Support Activities for Oil and Gas Operations
213113	Support Activities for Coal Mining
213114	Support Activities for Metal Mining
213115	Support Activities for Nonmetallic Minerals (except Fuels) Mining

6.1 NAICS Codes Related to Oil and Gas Production

There are three classifications directly related to the oil and gas exploration and production industry. These are NAICS 211 – Oil and Gas Extraction, NAICS 213111 – Drilling Oil and Gas Wells, and NAICS 213112 – Support Activities for Oil and Gas Operations. These three classifications cover the operating companies, drilling companies, and service companies, respectively. For this study, we consider them collectively as the oil and gas E&P industry. The definitions listed are those developed by the Office of Management and Budget.

NAICS 211 – Oil and Gas Extraction Industries in the Oil and Gas Extraction subsector operate and/or develop oil and gas field properties. Such activities may include exploration for crude petroleum and natural gas; drilling, completing, and equipping wells; operation of separators, emulsion breakers, desilting equipment and field gathering lines for crude petroleum and natural gas; and all other activities in the preparation of oil and gas up to the point of shipment from the producing property. The subsector includes the production of crude petroleum, the mining and extraction of oil from oil shale and oil sands, and the production of natural gas, sulfur recovery from natural gas, and recovery of hydrocarbon liquids.

Establishments in this subsector include those that operate oil and gas wells on their own account and for others on a contract or fee basis. Establishments primarily engaged in providing support services, on a fee or contract basis, required for the drilling or operation of oil and gas wells (except geophysical surveying and mapping, mine site preparation, and construction of oil/gas pipelines) are classified in Subsector 213, Support Activities for Mining.

NAICS 213111 – Drilling Oil and Gas Wells This U.S. industry comprises establishments primarily engaged in drilling oil and gas wells for others on a contract or fee basis. This industry includes contractors that specialize in spudding in, drilling in, redrilling, and directional drilling.

NAICS 213112 – Support Activities for Oil and Gas Operations This U.S. industry comprises establishments primarily engaged in performing support activities on a contract or fee basis for oil and gas operations (except site preparation and related activities). Services included are exploration (except geophysical surveying and mapping); excavating slush pits and cellars; well surveying; running, cutting, and pulling casings, tubes, and rods; cementing wells, shooting wells; perforating well casings; acidizing and chemically treating wells; and cleaning out, bailing, and swabbing wells.

6.2 Economic Impact Modeling

Economic impacts on an economy arise from exogenous sources or activities that inject new funds into the economy. Examples include products that are exported and new construction funding. It is important for outside funds to be injected into a regional economy for economic impacts to occur. If an activity is financed by funds from inside a regional economy, known as residentiary spending, then the funds are diverted from one industrial sector to another and there is no net multiplier effect or economic impact. Crude oil and natural gas from the producing areas in Utah are exported to refineries and markets in other portions of the country. Exporting oil and gas results in an inflow of funds, which creates a positive economic impact on the area.

In this study, economic impact is used to mean the impact of oil and gas E&P activities on the amount of employment and wages paid in the various producing regions in Utah. Many similar studies present the total economic output of an activity as the economic impact; this is the sum of all transactions in a supply chain and can be much larger than the value of the final good or service provided to the end consumer. Similarly, many authors apply economic output multipliers to all spending related to an activity, with no distinction between export-based and residentiary spending. The result is often termed "economic contribution" and presented as economic impact. As with all economic output calculations, the result is much larger than the value of the final product delivered to an end consumer.

The oil and gas exploration and production industry has a direct impact on the local economy through employment and wages paid. In addition, there are additional indirect and induced impacts. Indirect impacts result from local spending by the E&P industry and induced impacts arise from employees of the E&P industry spending their earnings.

Examples of indirect impacts are employment and wages at seismic companies, regulatory and environmental consulting firms, consulting geologists, trenching and dirtwork, and utilities providing electricity. Other benefits accrue to local hotels and restaurants as a result of spending by visiting workers. The indirect and induced impacts can be calculated from the value of transactions between the E&P industry and these other businesses.

The RIMS II input-output model developed by the Bureau of Economic Analysis was used to determine the indirect and induced economic impacts of the oil and gas exploration and production industry in Carbon and Emery Counties. The RIMS II model is based on an accounting framework called an input-output table. From each industry, an input-output table shows the industrial distribution of inputs purchased and outputs sold. The Bureau of Economic Analysis has developed a

national input-output table (Bureau of Economic Analysis, 1997). To develop region-specific input-output tables, the national input-output table is modified using regional economic data. The producer portion of the input-output table is modified using location quotients at the six-digit NAICS level based on personal income data for service industries and wage and salary data for nonservice industries. Household data is modified to account for commuting across regional boundaries and savings and taxes. Once the national input-output table is regionalized, the multipliers are estimated through the use of matrix algebra. The RIMS II model estimates the employment and wage impacts by major NAICS industry.

Data on spending by the E&P industry in the two counties was obtained via a survey of operating, drilling and service companies operating in the area. Personnel with the Bureau of Economic and Business Research at the University of Utah worked with the Independent Petroleum Association of the Mountain States (IPAMS) to developed survey forms with input from several representatives of the petroleum industry. IPAMS distributed the survey forms to operating, drilling and service companies operating in Carbon and Emery Counties and the forms were returned to the Bureau of Economic and Business Research. Data from returned survey forms was totaled by spending category. Using data on total production of oil and gas, number of wells spudded and employment reported by government agencies, the total spending reported by responding companies was expanded to total industry spending in the region. The multipliers from the RIMS II model were then applied to the total spending by category to determine the indirect and induced employment and wages. Trade margins were applied to the Retail Trade, Wholesale Trade, and Transportation industries.

State income tax impacts were estimated by calculating the ratio of the Utah income tax liability for Carbon and Emery Counties to the sum of the total earnings by place of work for the two counties as determined by the Bureau of Economic Analysis. The average of this ratio for the years 2003 through 2005 was 4.02 percent. This ratio was then applied to the total estimated earnings due to oil and gas E&P in Carbon and Emery Counties of $22.2 million to estimate the state personal income tax.

7 References

Bureau of Economic Analysis. 2007. Local Area Personal Income. http://www.bea.gov/regional/reis/. Downloaded Nov. 6, 2007.

Bureau of Labor Statistics. 2007. Quarterly Census of Employment and Wages. http://stats.bls.gov/cew/home.htm. Downloaded Sept. 9, 2007.

Energy Information Administration. 2007. *Short-Term Energy Outlook September 2007.* http://www.eia.doe.gov/emeu/steo/pub/contents.html. Downloaded Sept. 11, 2007.

Isard, W., I.J. Azis, M. P., Drennan, R. E. Miller, S. Saltzman, and E. Throbecke. 1998. *Methods of Interregional and Regional Analysis*. Ashgate Publishing Limited. 490 pp.

Minerals Management Service. 2007. MRM Statistical Information. http://www.mrm.mms.gov/MRMWebStats/default.aspx. Downloaded Oct. 3, 2007.

Montgomery, S. L., D. E. Tabet., and C. E. Barker. 2001. Upper Cretaceous Ferron Sandstone: Major Coalbed Methane Play in Central Utah. *AAPG Bulletin*. vol. 85, no. 2, February 2001. pp. 199-219.

Office of Management and Budget. 2007. *North American Industry Classification System.* 1390 pp.

Schaffer, W. A. 1999. *Regional Impact Models*. West Virginia University Regional Research Institute. http://www.rri.wvu.edu/WebBook/Schaffer/index.html. Accessed July 18, 2007. 80 pp.

Tabet, D. E., and J. C. Quick. 2003. Frontier Area for Coalbed-Gas Exploration in Utah. *Survey Notes.* Utah Geological Survey. vol. 34, no. 2. April 2003. pp. 10-11.

U.S. Bureau of the Census. 2007. Subcounty Population Data Sets. http://www.census.gov/popest/cities/SUB-EST2006-states.html. Downloaded Sept. 12, 2007.

Utah Department of Transportation. 2007. Mineral Lease Distributions. http://www.dot.utah.gov/main/f?p=100:pg:11808295696151236794:::1:T,V:135,. Downloaded Oct. 4, 2007.

Utah Division of Oil, Gas and Mining. 2007. Production Reports. http://oilgas.ogm.utah.gov/Publications/Publications.htm. Downloaded Sept. 12, 2007.

Utah Geological Survey. 2006. *Utah! 100 Years of Exploration and Still the Place to Find Oil and Gas.* Public Information Series 71. nonpaginated.

Utah Governor's Office of Planning and Budget. 2000. *Federal Land Payments in Utah*. http://governor.utah.gov/dea/Publications/Report.pdf. Downloaded Sept. 11, 2007.

Utah State Tax Commission. 2007. Revenue Reports (TC-23). http://www.tax.utah.gov/esu/revenue/index.html. Downloaded Nov. 5, 2007.

Utah State Tax Commission. 2007. Utah Income and Corporate Tax Statistics. http://www.tax.utah.gov/esu/income/index.html. Downloaded Nov. 2, 2007.

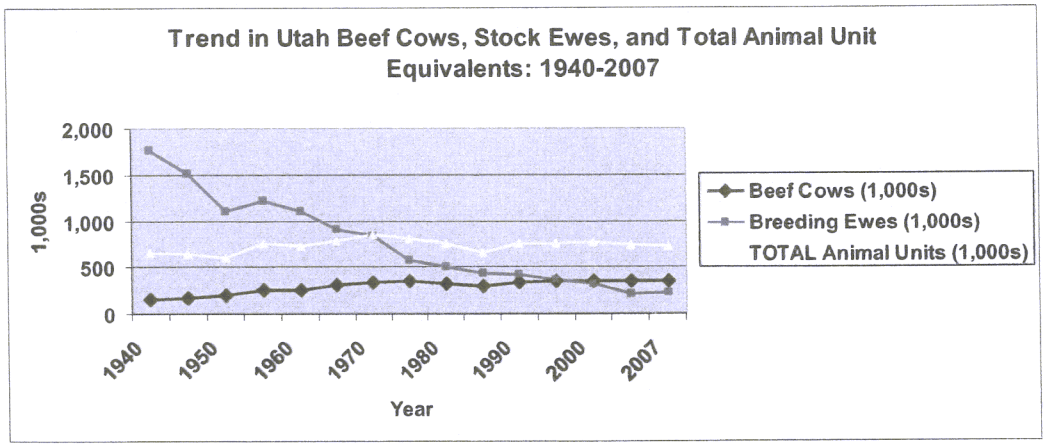
ATTACHMENT E

ATTACHMENT E

Livestock Industry Issues

Beef cattle and stock sheep in Utah, 1940-2007

1. The number of beef cows (breeding herd) has more than doubled in Utah over the past 67 years while the number of ewes (breeding herd) has declined to only about 12% of what it was in 1940.
2. The decline in the sheep industry reflects the decline in demand for wool, consumer preference for lamb, more restrictive predator control policies, and difficulties in obtaining labor.
3. Sheep and lamb losses to predators have declined in Utah over the past 20 years. This may be a result in use of guard dogs and other kinds of improved management.
4. Many federal grazing permits have been transferred from sheep to cattle permits and total animal unit equivalents have varied some over the past 67 years.
5. Animal units equivalents (AU's) have declined by about 20% since the 1940's based on cow and ewe numbers. This decline may be more related to an increase in animal size over the period than to an actual decrease in capacity.
6. The decline in the sheep industry and fire control policies coincide with the gradual increase in woody plant domination on Utah rangelands.

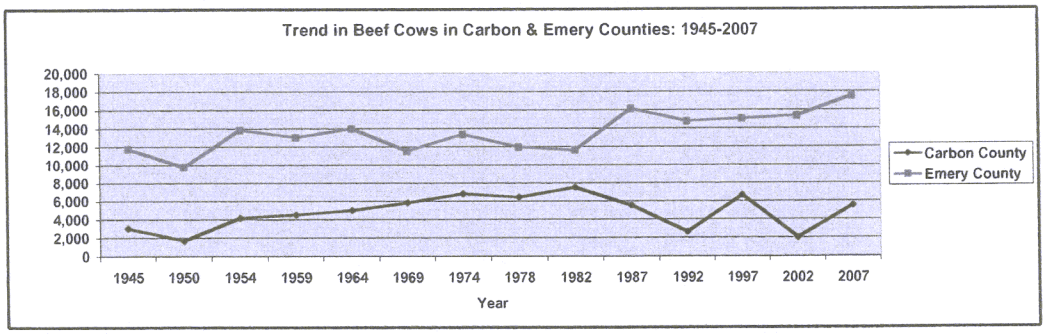


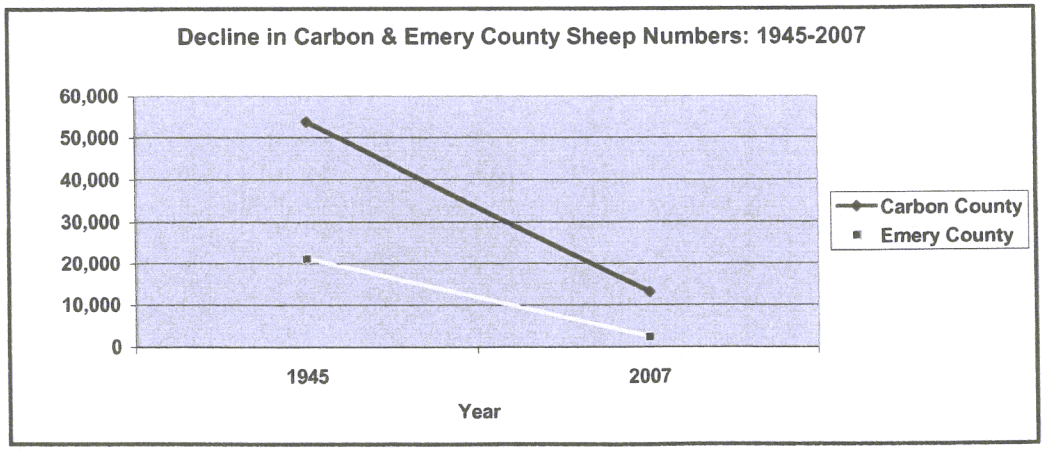
Year	Beef Cows (1,000s)	Breeding Ewes (1,000s)	TOTAL Animal Units (1,000s)
1940	155	1,762	662
1945	172	1,516	647
1950	194	1,099	608
1955	256	1,223	757
1960	252	1,099	724
1965	301	903	783
1970	342	846	853

1975	349	575	813
1980	325	506	751
1985	289	432	664
1990	333	420	750
1995	345	357	761
2000	355	321	774
2005	347	208	736
2007	344	220	732

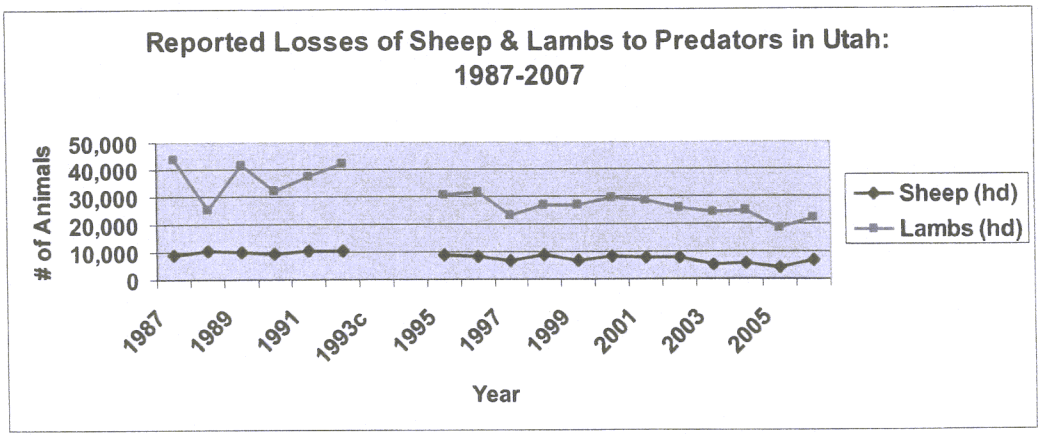
Number of Beef Cows and Ewes in Carbon and Emery Counties, 1945-2007

1. Beef cow numbers have increased modestly in some Utah counties, perhaps due to improved production techniques. However, numbers have declined in some urban counties such as Davis and Washington counties.
2. Carbon County has experienced an increasing trend in beef cow to about 158% of 1945 levels while resident sheep numbers have declined from 53,775 ewes in 1945 to 13,000 in 2007 or about 24% of 1945 levels.
3. Emery County beef cow numbers have increased to approximately 115% of 1945 levels (the long-term trend is slightly upward). Resident sheep numbers have declined from 21,063 ewes in 1945 to 2,400 ewes in 2007 or about 11% of 1945 levels.





Reported Losses of Sheep and Lambs to Predators 1987-2007



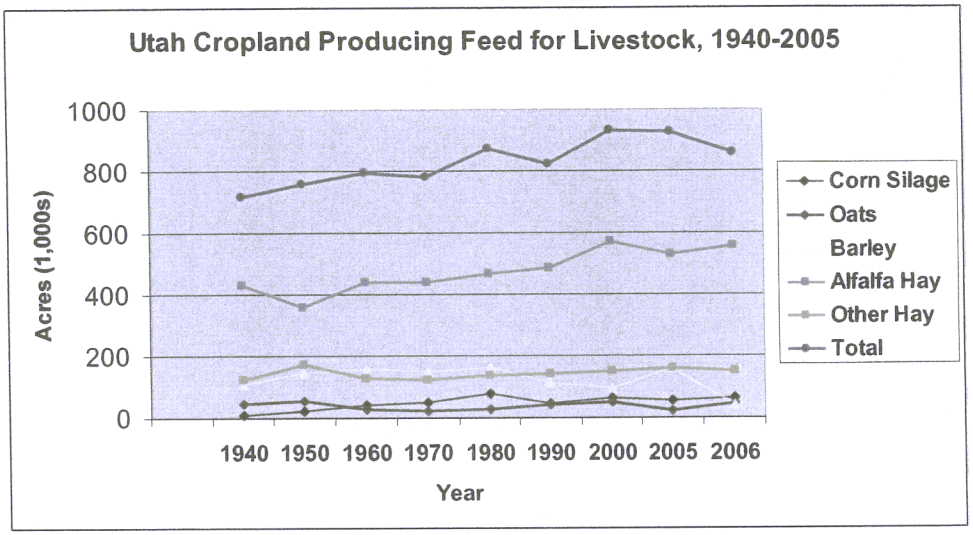
Year	Sheep (hd)	Lambs (hd)
1987	9,200	43,800
1988	10,500	25,200
1989	10,200	41,600
1990	9,300	32,200
1991	10,300	37,600
1992	10,500	42,200
1993[c]		
1994[c]		
1995	9,100	30,700
1996	8,400	31,400
1997	6,700	23,300
1998	8,700	27,100
1999	6,600	26,700
2000	8,200	29,300
2001	7,900	28,300
2002	8,100	25,700
2003	5,400	24,100
2004	5,700	24,600
2005	4,300	18,500
2006	6,700	22,300

[a]Utah Agricultural Statistics (1988-2007)
[b]Losses not reported for Bobcat and Fox until 1995
[c]Losses not reported in 1993 and 1994

Utah Crop Land used to produce livestock feed, 1940-2005

1. Acreage devoted to production of grains and forages for livestock has increased from 718,000 acres to 860,000 acres in Utah since 1940. Changes in irrigation technology could have contributed to this 20% increase in acreage.
2. Corn silage acreage has increased, oat acreage has remained the same, barley acreage has declined, and alfalfa and other hay acreage have increased. (These changes may also reflect changes in irrigation technology.)

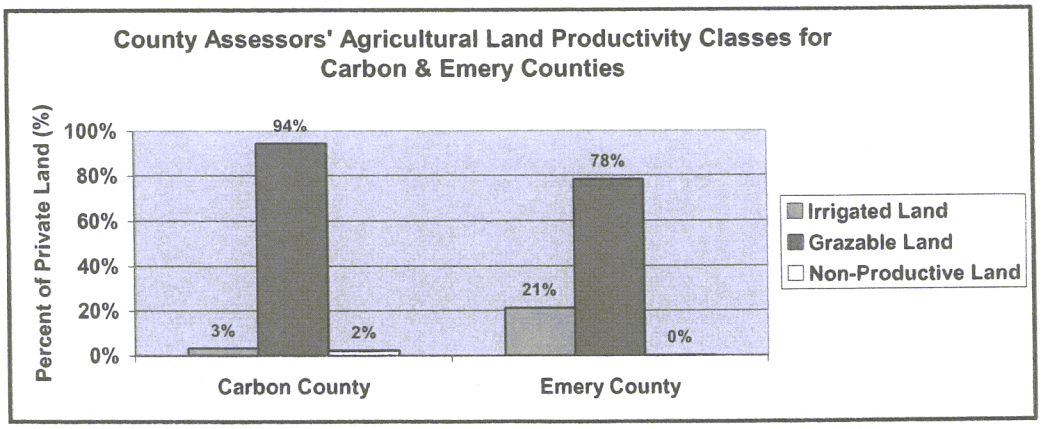
3. The Carbon and Emery County Assessors have identified 8,583 acres of arable private land in Carbon County (3% of the private land) and 29,980 acres of arable private land in Emery County (21% of the private land). The County Assessors consider most of the private land (94% in Carbon County and 78% in Emery County) to be grazable land (low productive capacity).



Utah Crop land used to produce livestock feed, 1940-2005[a]

Year	Corn Silage	Oats	Barley	Alfalfa Hay	Other Hay	Total
1940	10	46	109	431	122	718
1950	21	56	146	361	173	757
1960	41	29	160	439	127	796
1970	49	24	148	441	122	784
1980	79	26	162	470	135	872
1990	45	40	115	485	140	825
2000	64	50	95	575	150	934
2005	55	22	160	530	160	927
2006	65	45	40	560	150	860

[a]Source: Utah State Department of Agriculture (1984-2007)



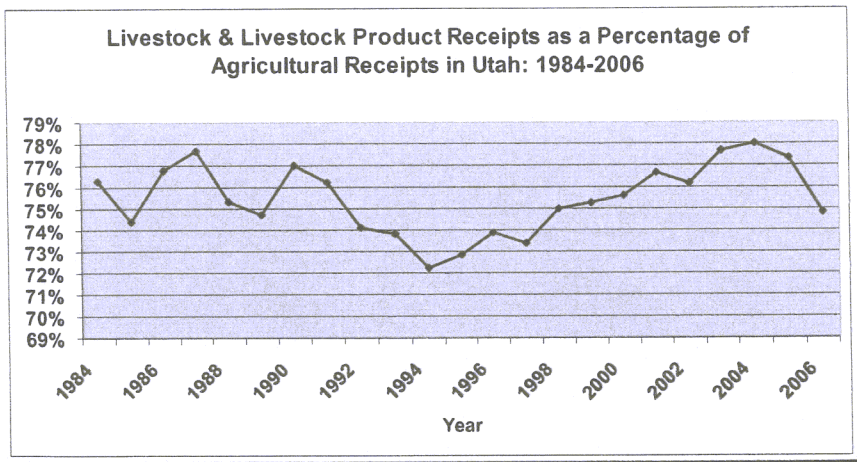
Receipts related to the livestock industry in Utah, Carbon and Emery Counties 1984-2006.

1. Receipts from Utah livestock and livestock products have doubled in nominal terms since 1984.
2. Receipts (nominal) of livestock and livestock products represent an average of 75% (range 72%-79%) of all agricultural receipts in Utah over the last 23 years.
3. Carbon and Emery County livestock and livestock product receipts (nominal) have increased from around $3 million annually in Carbon County and $7 million in Emery County to about $6 million in Carbon County and $21 million in Emery County over the past 23 years. This represents an increase of 133% in nominal terms in Carbon County and a 250% increase in nominal terms in Emery County.
4. Receipts (nominal) of livestock and livestock products represent an average of 82% (range 72%-90%) of all agricultural receipts in Carbon County over the last 23 years.
5. Receipts (nominal) of livestock and livestock products represent an average of 83% (range 78%-88%) of all agricultural receipts in Emery County over the last 23 years.

Utah Livestock and Livestock Product Receipts 1984-2006 (Millions of Dollars)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
State of Utah	773	716	766	801	915	979	1,011	947	956	1,059	1,026	1,017

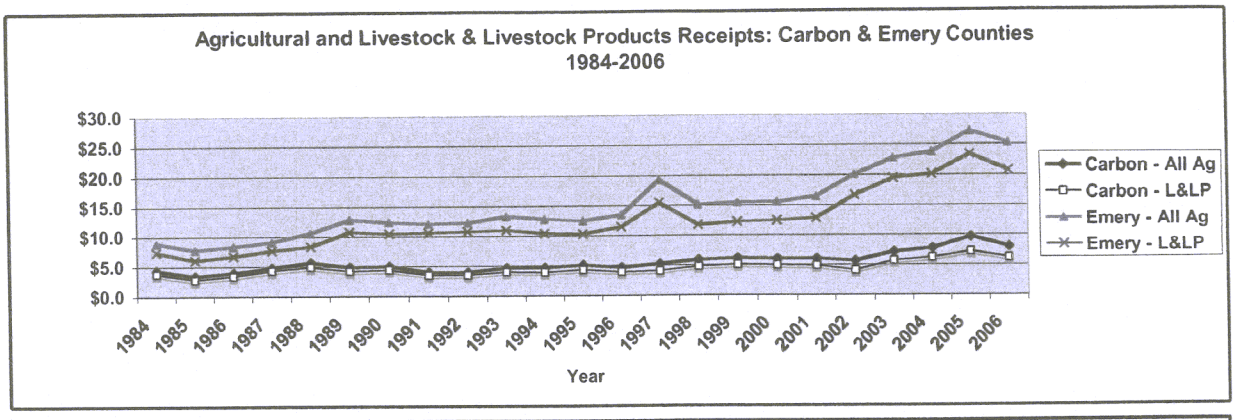
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
State of Utah	1,099	1,186	1,237	1,185	1,268	1,408	1,366	1,470	1,641	1,762	1,578

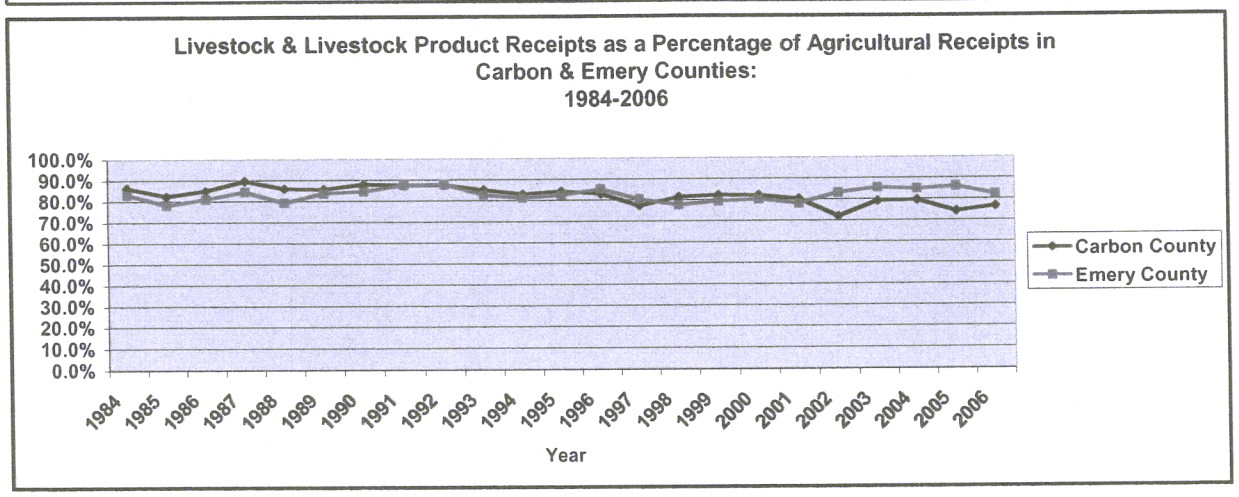


Livestock and Livestock Product Receipts as a Percent of Agricultural Receipts in Utah 1984-2006

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
State of Utah	76%	74%	77%	78%	75%	75%	77%	76%	74%	74%	72%	73%

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
State of Utah	74%	73%	75%	75%	76%	77%	76%	78%	78%	77%	75%

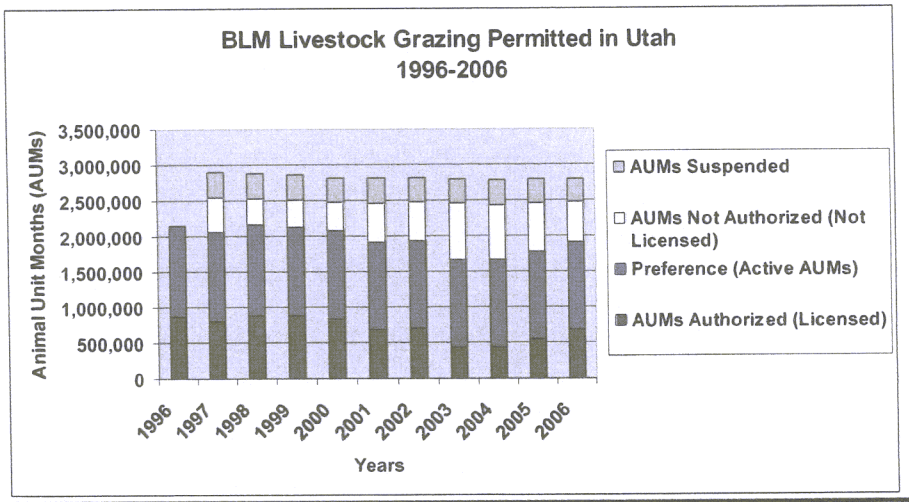




BLM Livestock Grazing Permitted in Utah 1996-2006

1. There was a general decline (downward trend) in BLM authorized use in Utah from around 1,400,000 AUMs in 1965 to around 800,000 AUMs by 1995 (43% decline) and as low as 435,000 in 2003. Grazing preference has remained relatively stable since 1995 but authorized use has average only around ⅔ of preference through time. This is partly by choice by the ranchers but also reflects the level of use BLM is willing to license through time or in a given year. Authorized use was restricted significantly (to ±⅓ of preference) statewide during 2003-2005 in response to drought.
2. The trend in livestock grazing preference and authorized use in the Price Field Office Planning Area is downward. Permitted AUM level proposed in the Draft RMP Preferred Alternative is difficult to discern. It is unclear whether or not allotment closures and AUM reductions addressed in the 2004 Draft RMP (Table 3-25) are reflected in Table 3-24. It is also difficult to discern whether or not changes in Livestock Grazing AUMs reported in Table 3-26 are reflected in Table 3-24. The 14,810 Active AUM reduction reported in Section 3.3.2 is assumed to be an additional adjustment to the 2003 value reported in Table 3-24. Regardless, permit AUMs have been reduced by at least 29% by 2003. Authorized us has declined by 63%.
3. The Price Field Office 1998 Land Exchange with SITLA resulted in 4,065 AUMs transferred from BLM Price FO to SITLA. This accounts for about 3% of the reported reduction in preference.
4. The 5,517 in Suspended Use AUM reduction reported for 24 allotments in Table 3-26 is the only recognition of suspended use in this Draft RMP or earlier planning documents. Although AUMs are proposed for reallocation to wildlife, watershed, reduced conflict with recreation and other purposes under all alternatives, the total level of suspended use on record for the planning area is not reported and no reinstatement of suspended use is proposed.

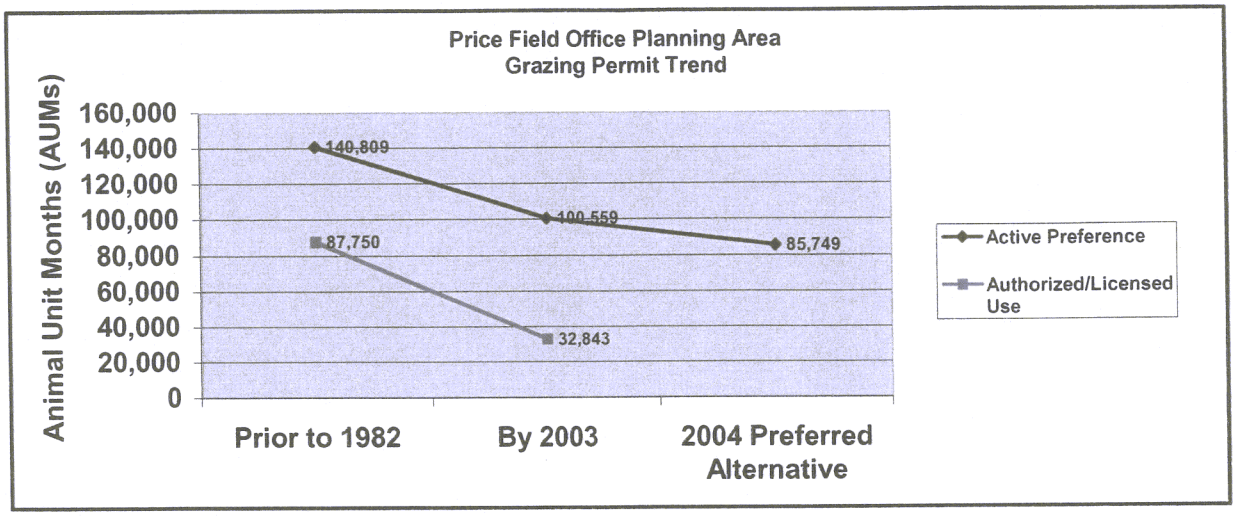
5. Fifteen or more grazing allotments have been closed to livestock since 1991 or are proposed for formal closing in the DRMP Preferred Alternative. Domestic sheep grazing is currently prohibited in currently occupied bighorn habitat and is proposed to be restricted more in the Preferred Alternative. All AUMs relinquished by livestock grazing permittees will be allocated to wildlife. There is a general trend in management within the Price Field Office to reduce or exclude livestock grazing in favor of other multiple uses and resource designations (wildlife benefits, recreation benefits, ACECs, etc.).
6. Licensed use varies from 40-60% of permitted use. This may be due to rancher drought risk management strategies (ranch business risk management) and/or BLM management authority. Licensed use in the 2000-2003 reflects increasingly severe drought conditions and reduced levels of use authorized by BLM. BLM approves the level of annual use authorized and licensed.
7. Authorized use is not projected into the future under the preferred alternative. However, actions are proposed that will significantly restrict authorized use and possibly preference over the long term. Some of these actions include interpretation of BLM policy guidelines, closing of allotments or portions of allotments for wildlife benefit, recreation, watershed health, erosive soils, riparian enhancement and cultural conflict (i.e., to resolve identified but unsubstantiated resource problems); special area designations including designation of ACECs, recreation areas and extensive/enlarged wildlife protected areas.

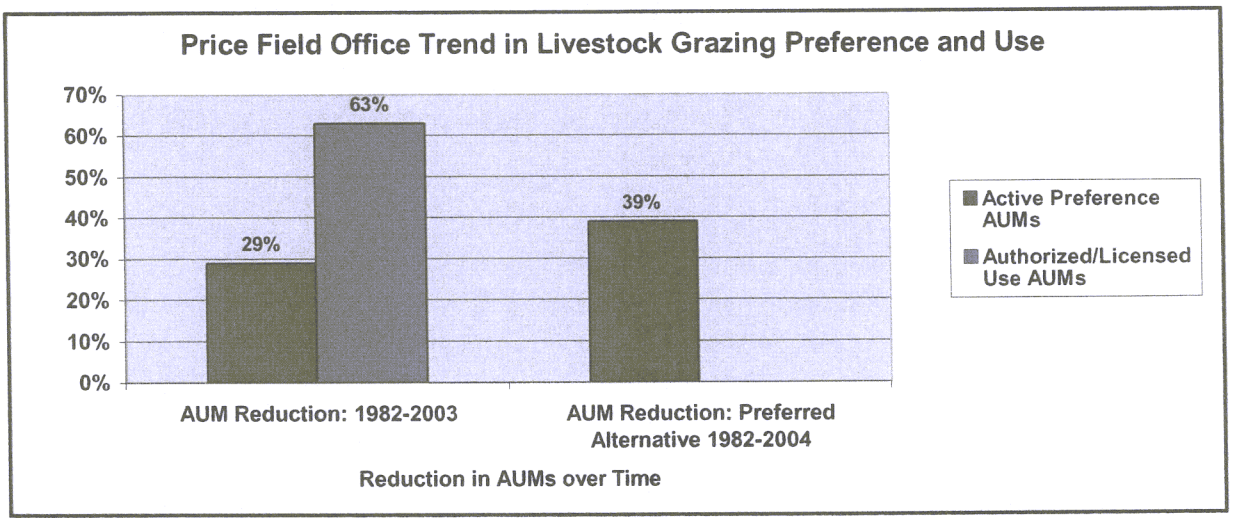


BLM Livestock Grazing Permitted in Utah 1996-2006

Year	AUMs Authorized (Licensed)	Preference (Active AUMs)	AUMs Not Authorized (Not Licensed)	AUMs Suspended	Number of Permits
1996	868,163	1,280,656			1,648
1997	798,881	1,273,899	475,018	352,017	1,641
1998	890,741	1,268,245	377,504	352,317	1,622
1999	880,091	1,257,063	376,972	346,383	1,665
2000	833,715	1,241,880	408,165	339,835	1,593
2001	678,393	1,235,236	556,843	347,895	1,576
2002	703,067	1,237,940	534,873	333,768	1,557
2003	435,406	1,231,344	795,938	332,327	1,543
2004	439,185	1,220,757	781,572	333,678	1,531
2005	544,458	1,237,117	692,659	327,801	1,525
2006	686,267	1,238,005	551,738	324,159	1,504

Price BLM Livestock Grazing Trends





Price RMA BLM Livestock Grazing Allotment Map